

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2531.—VOL. LIV.

LONDON, SATURDAY, FEBRUARY 23, 1884.

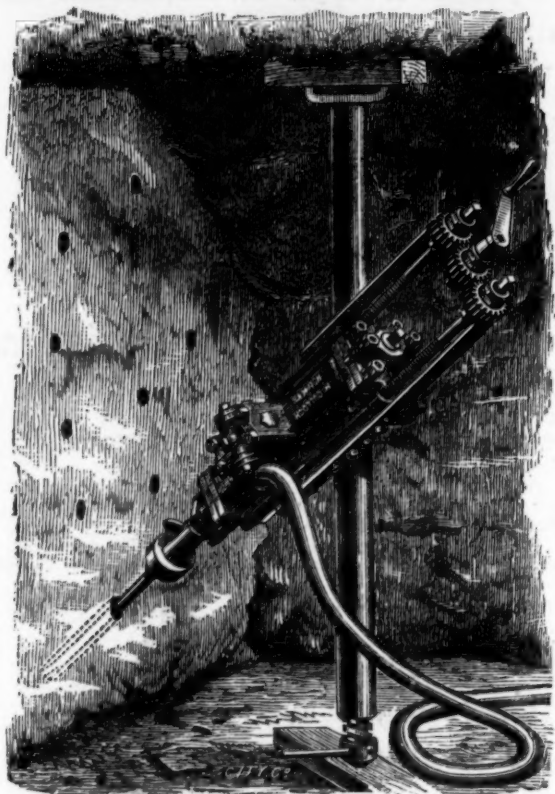
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FIRST SILVER MEDAL, ROYAL CORNWALL POLYTECHNIC
—Highest Award for Effectiveness in Boring, and Economy in
the Consumption of Air

JUBILEE EXHIBITION, 1882.

THE PATENT

"CORNISH" ROCK DRILL.



This Drill has been constructed after a long practical experience in the requirements necessary for Mines, and has more than realised the expectations of its inventors. The chief objects in view were GREATER DURABILITY AND LESS LIABILITY TO DIS-ARRANGEMENT; but it has also proved itself more EFFECTIVE AND ECONOMICAL.

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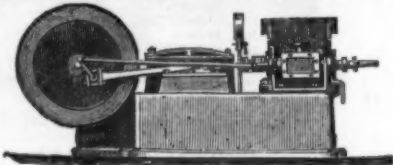
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THE PATENT
"ECLIPSE" ROCK-DRILL

"RELIANCE AIR-COMPRESSOR."

First Silver Medal awarded at Boring Competition, East Pool Mine, Sept. 1881.

PRIZE MEDAL,
HIGHEST AWARD.



PARIS EXHIBITION,
1878.

ARE NOW SUPPLIED TO THE
ENGLISH, FOREIGN, AND COLONIAL GOVERNMENTS
And are also in use in a number of the
LARGEST MINES, RAILWAYS, QUARRIES, AND HARBOUR
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FOR ILLUSTRATED CATALOGUE AND PRICES apply to—
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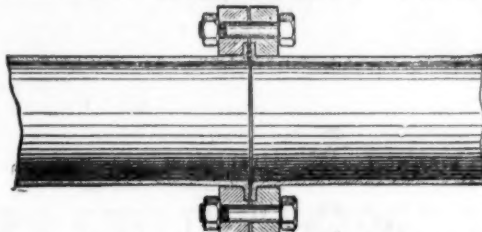
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MEDALS AND HIGHEST AWARDS
SEVEN YEARS IN SUCCESSION
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London International Exhibition, 1874.
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Leeds Exhibition, 1875.
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Rio de Janeiro Exhibition, 1875.
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AUTOMATIC FEED
(Perfect success)
GREAT STEADINESS.
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IN GRANITE,
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Price £50 complete.

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HOSKING AND BLACKWELL'S PATENT.

SUPPLY their CELEBRATED ROCK DRILLS, AIR COMPRESSORS, &c., and
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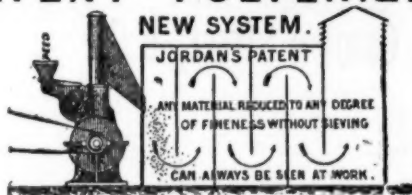
Their DRILLS have most satisfactorily stood the TEST of LONG
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numerous mines in Great Britain and other countries clearly proving
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About 200 are now at work driving from three to six times the
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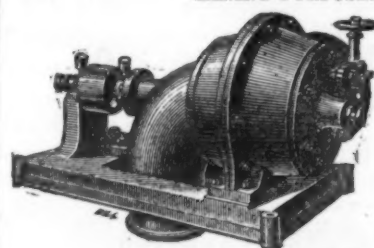
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land.

FIRST AWARD.
SYDNEY. 1879.

BICKFORD'S PATENT FUSES

FIRST AWARD.
MELBOURNE, 1881.



SILVER MEDAL OF THE MINING INSTITUTE OF CORNWALL, TRURO, 1880,
for an Improved Method of Simultaneous Blasting.

BICKFORD, SMITH AND CO.,

THE INVENTORS, AND ORIGINAL PATENTEES AND MANUFACTURERS OF
SAFETY AND INSTANTANEOUS FUSES AND IGNITERS

FOR USE IN ALL BLASTING OPERATIONS AND SPECIALLY PREPARED FOR ANY CLIMATE

Note the **TRADE MARK**: Two Separate threads through centre of Fuse.

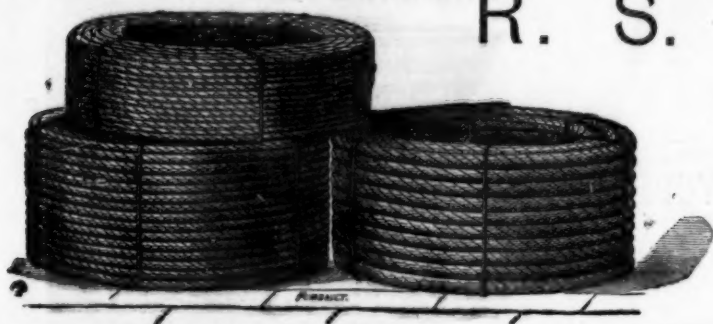
BICKFORD, SMITH AND CO.'S Patent Igniters and Instantaneous Fuses for simultaneous blasting are being extensively used at home and abroad. This improved method is the cheapest, simplest, and most dependable ever introduced for simultaneously firing any number of charges. For full particulars, see Descriptive Catalogue.

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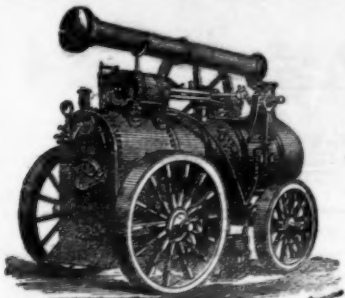
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IRON STEEL, AND COPPER CORDS. LIGHTNING CONDUCTORS.
COPPER CABLES of high Conductivity for Electric Light and Power.

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MANUFACTORY: GATESHEAD-ON-TYNE.

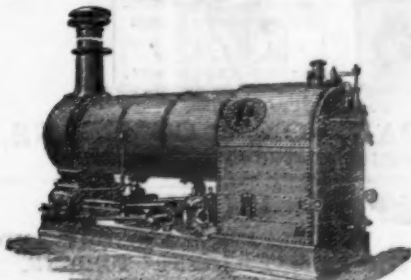
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The **PATENT "ROBEY" MINING ENGINE** is complete in itself, ready for putting down and setting to work, either as a Permanent or Temporary Winding or Pumping Engine.

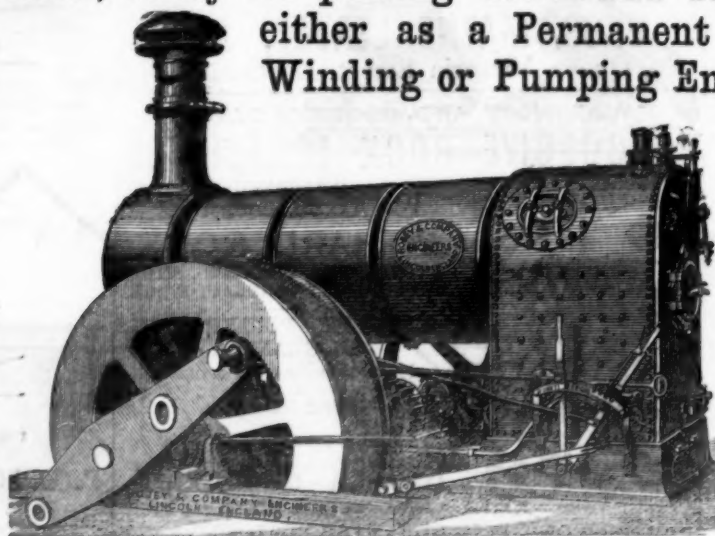


Robey's Superior Portable Engines,
4 to 50-h.p.

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The Improved Robey Fixed Engine and
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MINING JOURNAL Office, 24, Fleet-street;
And all Booksellers.

BORLAND'S PATENT INJECTOR.

SEE THE ENGINEERING PAPERS.

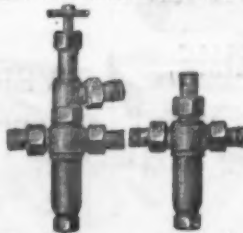
The cheapest and most economical.

Can be cleaned in a few minutes.

All parts made to gauge.

Made entirely of best gun metal.

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Has no moving parts.

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No joints to make.

Prompt and continuous action guaranteed.

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(Late Manager for Sharp, Stewart and Company, Limited, Atlas Works, Manchester. Upwards of 22 years with that firm.)
Price Lists, Particulars References, &c., on Application.

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Patent Steel Trucks, Points and Crossings,

PORTABLE RAILWAY, STEEL BUCKETS, &c., &c.

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In connection with the
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the principal Hotels and
places of business in the
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Telegraphic Address:-
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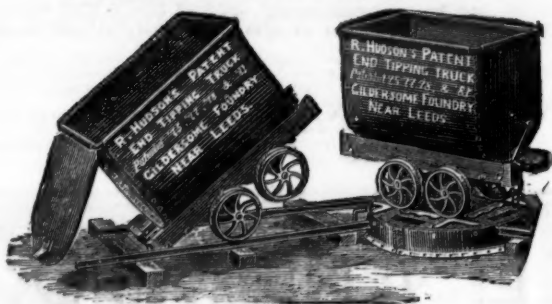
UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the **LIGHTEST, STRONGEST**, and most **CAPACIOUS** made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.

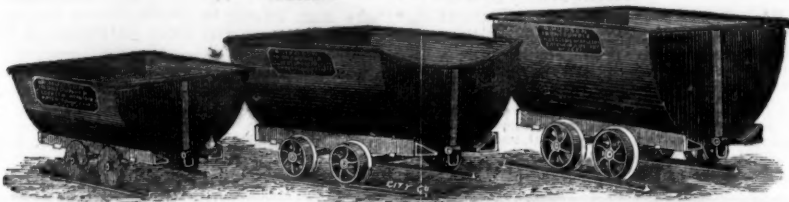
N.B.:—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

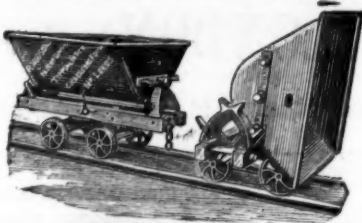
1.—PATENT STEEL END TIP WAGONS.



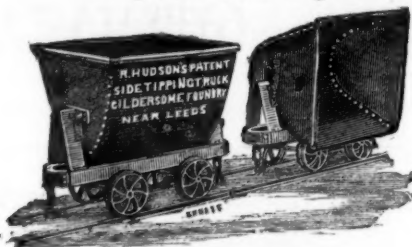
7.—PATENT STEEL MINING WAGONS.



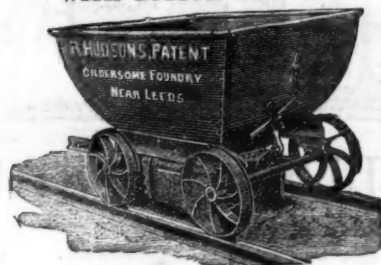
2.—PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK.
Will tip either side or either end of rails.



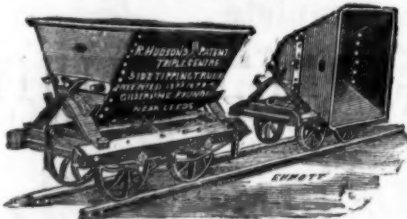
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS.
Will tip either side of Wagons.



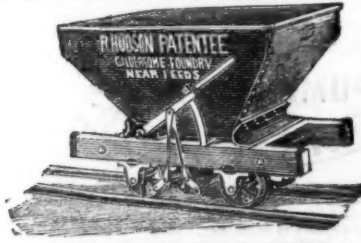
12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.



3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



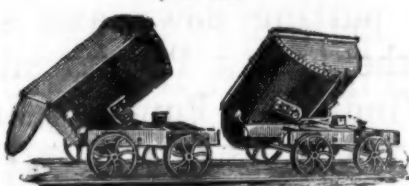
13.—PATENT STEEL HOPPER WAGON.



4.—PATENT STEEL PLATFORM OR SUGAR CANE WAGON.



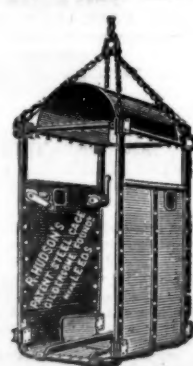
9.—PATENT STEEL ALL-ROUND TIP WAGON.



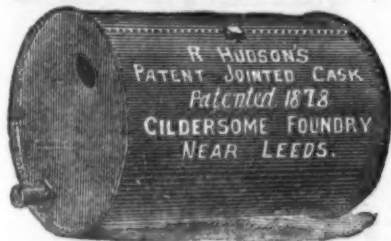
14.—SELF-RIGHTING STEEL TIP BUCKET.
(The "CATCH" can also be made SELF-ACTING if desired.)



15.—STEEL CAGE.



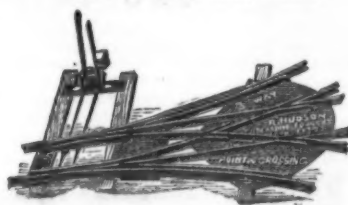
5.—PATENT STEEL CASK.
As supplied to H.M. War Office for the late war in Egypt).
DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight.
(Made from 10 gals. capacity UPWARDS to any desired size.)



10.—LEFT-HAND STEEL POINT AND CROSSING.



11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.



16.—PATENT STEEL WHEELBARROWS.
Made to any Size.
Lightest and Strongest in the Market.



17.—STEEL SELF-CONTAINED TURNTABLE.



(Also made in Cast Iron for use where weight is not a consideration.)

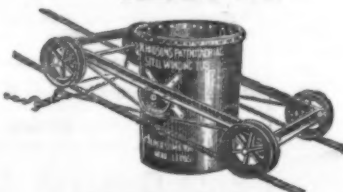
6.—ROBERT HUDSON'S PATENT IMPROVED IRON SMITH'S HEARTH.
NO BRICKWORK REQUIRED.

A Special quality made almost entirely in STEEL, effecting a GREAT SAVING IN WEIGHT.



Large numbers in use by all the principal Engineers in this country and abroad.

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Largely employed in the South African Diamond Fields.

No. 19.—PATENT STEEL CHARGING BARROW, DOUBLE the STRENGTH & much LIGHTER than ordinary Barrows.



ALL KINDS OF BOLTS NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES

BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING, for High Pressure Engines. This Packing has been specially designed to overcome the difficulties experienced by engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the reconstruction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realised unless the Packings are so constructed as to avoid stoppages for the purpose of re-packing the stuffing boxes. It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. This Packing has met with the most unqualified approval wherever it has been used, and on being taken out after about twelve months, working at 70 lb. pressure, it has been found to be in a perfect state of preservation, and was therefore replaced. The Patent Block Packing is square, as Fig. 1, and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with rubber inlay. An Engineer writes:—"The Asbestos Block Packing works splendidly. I have never seen its equal. We keep our gland nuts so that you can move them with finger and thumb, and can maintain a constant vacuum of 28½ in." As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, users are requested to see that the packing supplied to them bears my trade mark.

BELL'S ASBESTOS BOILER PRESERVATIVE. This useful mixture by absorbing the free oxygen that is in the water entirely checks pitting and corrosion. It also disinfects incrustation so immediately as to prevent its adhering to the plates. Not only is a great economy of fuel effected by keeping boilers clean, but the risk of having the plates burned is thereby obviated. It has been computed that ¼ in. thick of incrustation causes a waste of 15 per cent. of coal; ½ in., 60 per cent.; ¾ in., 150 per cent. Thus the Preservative avoids the great risks which are inseparable from scaled plates, lengthens the life of a boiler, and covers its own cost a hundred-fold by economy of fuel. It is entirely harmless, and has no injurious action on metals. It can be put into the feed tank or boiler, as may be most convenient. Sold in drums and casks bearing the Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING

for Locomotives, and all Stationary Engines running at very high speed with intense friction.

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Portmadoc, January 13, 1883.

Mr. John Bell, 118, Southwark-street, S.E.
DEAR SIR,
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Yours truly,
(Signed) W. WILLIAMS.



The goods of this house are of the highest quality only, and no attempt is made to compete with other manufacturers by the supply of inferior materials at low prices. All orders must be sent direct to the under-mentioned depots and not through Agents or Factors.

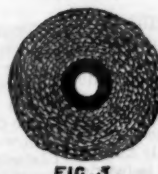
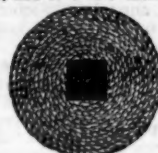


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Original Correspondence.

SUGGESTIONS FOR GEOLOGISTS—JUSTICE FOR THE INFUSORIA.

SIR,—In looking over Mr. Darwin's Origin of Species I come across the following question, which is left unanswered:—"What advantage would it be to an infusorian animalcule . . . to be highly organised?" Oh! Darwin, Darwin! Would that my eyes had lighted upon this whilst thou wert still in the flesh! Return for a moment from Elysian plains that I may answer thee. Pray nether Hermes to lead thee hence again from Stygian shades to listen to my logic. Ask of the mighty Heracles that he will bring thee back, as once he brought Alceis, that thou mayest hear my argument. Oh! that I had thee for an evening at the Quinotilian! I would bid thee choose thy men, I would choose mine, and we would debate the question fairly till thou shouldst cry, "Hold! enough!" But why waste words in vain apostrophe? Though I regret that Mr. Darwin is not here, let me not forget my duty, but let the truth prevail.

Now for a calm and temperate consideration of the case. I would say at the outset that I take the ground that the whole principle of the question is wrong. It is a question which would more fitly come from Sheridan's Mr. Sner than from a man like Mr. Darwin. Is it not the question upon which are based all the great social problems of the day? What advantage would it be to the infusorian animalcule to be highly organised? What advantage, forsooth, one might as well say, would it be to the lower stratum of society to be organised—to be made partakers of the wealth which others have won or have inherited? What advantage to the Irish tenant to be taught that he is as good as his landlord and better?

"When Adam delved and Eve span
Where was then the gentleman?"

The American Constitution declares that all men are born equal, and sure it is an honourable document. Shall we not then equally maintain the rights of the infusorian animalcule to a high organisation? Because it is a poor earthworm, must it always be trodden under foot? Let me carry Mr. Darwin back to his own theory. Is not the infusorian animalcule equally honourable in ancestry with himself? Where was the difference in days of protoplasmic simplicity? See how beautifully the idea of liberty, equality, and fraternity is here set forth? Because it has come to pass that one animal has developed into a highly organised being while another still remains a worm of the earth are we to say it must continue so to be? As well might it be maintained that because one family has from generation to generation been intelligent, thrifty, and industrious while another has been stupid and shiftless, the children of each are not born equal and with an equal claim upon the good things which should be common to all.

Such a fond argument would be destructive to all democratic principles, to socialistic reform, to agrarian laws, and to the glorious constitution of the American States. Away then with such a thought! Where is liberty if each is to hold his own? Where is equality if wits and worth are to rise supreme? Where is fraternity if the clodhopper is not to be placed on a social level with the King? Let us insist upon the amelioration of all. Let all paupers be made rich, and all fools philosophers. Raise the infusorian animalcule. Recognise in him a brother. Treat with the scorn which it deserves the pride—the aristocratic and plutocratic conservatism of those who would suggest that it would be of no advantage to this humble kinsman to be highly organised. Reason is gradually prevailing and will prevail; and the day is at hand when men will dig carefully for the infusorian animalcule not as bait for fishes, but to lead him into the way of light and higher development.

PHILOLOGUS PHIPP, Ph. D.

—In King's College Record (Windsor, N.S.)

OPHIR AND RUSH VALLEY MINING DISTRICTS—No. V. UTAH IRON.

SIR,—Iron ore is found more or less throughout the Territory, but notably in large quantities in certain places. The most important iron deposits occur in Iron County, about 300 miles south of Salt Lake City. The iron belt here is over three miles wide, and commences several miles north of Iron Springs, running in a south-westerly direction to Iron City, a distance of over 16 miles. One of the most prominent points in this belt is Iron Mountain, 1500 ft. elevation above the surrounding plain. The central part of this belt, Desert Mound, is six miles long and three miles wide. The country rock is granite, porphyry, and limestone. This limestone is used as flux. The character of the ore is hematite and magnetite, demonstrating in different tests made that they are well qualified for the production of fine Bessemer ore. It is estimated that there are 500,000,000 tons of good ore in sight in Iron County. An analysis of this ore gives the following results:—No. 1, iron, 64; phosphorus, 12; sulphur, 0.12; silica, 5.2 per cent. No. 2, iron, 62.60; phosphorus, none; sulphur, 0.12; silica, 4.8 per cent. No. 3, iron 60.90; phosphorus, none; sulphur, 0.08; silica, 5.7 per cent. An analysis of the limestone gives 80.35 per cent. carbonate of lime, and 10.92 per cent. of insoluble silicious material.

There are large beds of good coal within 25 miles distance of the Iron County deposits of iron. In Cache County, at Smithfield, occur beds of micaceous hematite 60 ft. and more in thickness. Around Ogden, on the Provo, by Kamas, on the Weber, in Ogden Canyon, near Willard and Bountiful, in the Cottonwoods, Red Butte, and City Creek Canyons, in Tintic; yes, all over Utah iron ore in all possible varieties is found. It accompanies numerous deposits of our lead and silver ores, being valuable on account of its percentage in gold and silver, and used as flux. At present our smelters derive their greatest supply of iron to be used in their establishments as flux from Tintic mining district. In this district the iron ores occur in a belt two miles long and over 1000 ft. wide, bearing north-east and south-west. The Tintic iron ore occurs as peroxides and sesquioxides of iron or hematite in strong veins, assaying 60 to 70 per cent. of iron and \$5 to \$15 in gold and silver per ton. These ores are principally found in Tintic as bedded deposits in the Silurian limestone; they are not suited for any other purpose than flux on account of their containing other minerals. The principal deposits are in the mountain side at and near Dragon Hollow, which leads from Silver City up and across the summit of the Aquirrh mountain range. The ore breasts here are from 40 to 50 ft. high. Over 100,000 tons of iron ore has been already, and from 150 to 200 tons of iron is daily, extracted from the Tinto Iron Mines.

Iron ores for the purpose of fluxing silicious lead and silver ores are also extracted from the slopes of the Wasatch, above Willard; Morgan County iron deposits, near the line of the Union Pacific; from the Wah Wah Mountain range, 25 miles south-west of Frisco; from City Creek canyon; and from Iron County.

In view of the high freight rates from the East, and the consequent high price of iron, and in view of the enormous Utah coal deposits, the manufacture of iron might at once be undertaken in Utah Territory, under able management, with profit.

The finding of such iron ore, as well as that of other metals unutilised, has often been through chance discoveries or through a search to supply a local demand, but let there be once a demand and a chance for their future value at no distant day, as it now is the case, and plenty more is and will be discovered throughout Utah Territory. People, especially those of limited experience and information, are slow to enter industries with which they are not familiar, and thus too many are content to wait for others to prove the value of our great deposits of excellent iron, copper, coal, salt, gypsum, our immense deposits of sulphur, ozocerite, albertite, veins of graphite, seams of jet, &c., before they undertake to avail themselves of them. An animus, such as is displayed in the search for the precious metals, would reveal without fail such amounts of these as would astonish many at the resources of Utah Territory. All of these represent latent wealth, but awaiting the proper energy and development to become of real value. In the Salt Lake Mining Institute and Museum there are samples of iron, coal, jet, ozocerite, albertite, chrome pigments, Venetian red, chrome yellow, fire-proof

paint, fire-clay—in fact, they are storehouses of samples, and should be veritable bureaus of statistics of Utah's production.

W. BREDEMEYER, M.E., U.S. Surveyor.

Salt Lake, City, Feb. 1.

THE NACUPAI AND CHILE COMPANIES.

SIR,—The directors of the Nacupai Gold Mining Company (Limited) have had their attention called to a letter signed by Mr. Albert H. Nicholson, the superintendent of the Chile Gold Mine, dated Guayana, Dec. 25, 1883. It seems to be admitted that the real question between the Nacupai Company and the Chile Company is one of title, and may be shortly stated thus. Is it the Nacupai Company or is it the Chile Company which has the legal title according to the law of Venezuela to the Austin Concession known as No. 9?

Our company has always asserted that it purchased concession No. 9, with other concessions, through the Nouveau Monde Company, from the syndic of the Orinoco Company, in liquidation, at a sale conducted under the supervision of the Court, and that Mr. Nicholson has unlawfully invaded that property, and excused his invasion by resorting to an alleged title of Mr. Edmundo Snell, thus endeavouring to deceive his board as well as the public.

Mr. Nicholson, by his letter dated Dec. 25 last, for the first time publicly and practically admits the accuracy of our statements, and the board of the Chile Company, having circulated Mr. Nicholson's amongst their shareholders, have thereby shown their approval of his action.

The futility of Mr. Snell's title, based on the document which Mr. Nicholson propounds, is shown by the decree of the Supreme Court of Guayana, dated Ciudad, Bolivar, June 10, 1881, fully three months after the date of the document on which Mr. Nicholson relies.

The decree of June 10, 1881, was given in the case of the Nouveau Monde Company, the Potosi Company, and Mr. Snell, having made a similar attempt at that time to sell to the Potosi Company the rights alleged to have been acquired by him, and by the decree of the Court, his title, based on the same documents now set up by Mr. Nicholson, were declared invalid and of no effect, the Nouveau Monde Company being confirmed in lawful possession of the property.

Mr. Nicholson entirely suppresses this fact, and my directors, therefore, deem it necessary to annex a translation of the decree, which will be found at foot. It was published in the El Reivindicador paper of June 12, 1881, a print of which is in the possession of my directors.

Mr. Nicholson, like everyone in Venezuela, is aware of the existence of this decree, and conceals it from the Chile shareholders. He knows that the so-called titles of Mr. Snell are a mere pretext and delusion, but is courageous enough to admit that he has invaded and worked our concession (No. 9) for the benefit of his company. After the purchase of the ten Austin concessions by our company's agents their title was duly registered, and their dues regularly paid. We hold the receipts.

It is possible that Mr. Snell may have paid some dues, but if he did it must have been in some irregular manner during the time he was endeavouring to make a title to the property for himself. It is not necessary to refer again to the decisions quoted by Mr. Nicholson, as having been given in March and July of last year, inasmuch as it has already been stated that those orders did not affect the real question between the parties, but were only interlocutory applications on side issues, and by those applications Mr. Nicholson has succeeded in delaying a decision of the Court on the question (if any) at issue.

The last two paragraphs of Mr. Nicholson's production the directors of my company do not propose to notice for obvious reasons. Quotation in Latin and Greek do not in the least affect the question between the two companies, and it is much to be regretted that the directors of the Chile Company countenanced and approved such acts by their superintendent.

JOHN GARLAND,

Secretary of the Nacupai Gold Mining Company (Limited).

London, Feb. 22.

SUPREME COURT OF JUSTICE OF THE SECTION OF GUAYANA. CIUDAD, BOLIVAR, JUNE 10, 1881.

In view of the document submitted to this Supreme Court by the Citizen President of the State, whereby in accordance with Article 92 of the Code of Mines now in force, it is of the competency of this Court to examine the controversy raised between Edmundo Snell and the mining company Nouveau Monde, concerning the right of possession of the concession J. B. Austin, No. 9, which belonged to the bankrupt Mining Company of the Orinoco, with the evidence of the representatives of the Syndic, and several creditors in the hearing of the bankruptcy action brought against this company, and the evidence of the superintendent of the Nouveau Monde Company, this Court remarks:—It appears from the aforesaid information that Edmundo Snell having applied to the executive power of the State on Oct. 31, 1878, asking the registration of the transfer made in his favour of the concession No. 9 aforesaid, by the note addressed to him by Mr. C. C. Fitzgerald, agent of the Mining Company of Orinoco, under date Sept. 12, 1877, he, Edmundo Snell, obtained a favourable resolution or decree, and even he succeeded in causing orders to be sent to the treasurer, and to the Inspector of Mines informing them of the fact, having come to the knowledge of Senor Antonio Liccioni, Syndic of the bankruptcy of the Mining Company of the Orinoco, the above mentioned resolution or decree of the executive, he protested against it, drawing attention to the fact that the document presented by Snell in order to obtain surreptitiously the above-mentioned decree was simply a private letter addressed not to him personally, but to him as agent of the company "Sud-America," and that in it there was no concession or transfer of the concession No. 9, but only an authorisation conferred to administer the concession in question. That the executive power being in possession of the reasons alleged by the Syndic of the bankruptcy, and taking in consideration, as it is expressed in the motives of its decree of Nov. 6, 1878, that by Oct. 31 of the same year, date in which Edmundo Snell presented his petition, he was already deprived of the character of agent of the company "Sud-America," and thereby without authority to administer the land which included the 20 hectares of the Orinoco Company, being question, the executive declared null and void the above-mentioned orders addressed to the treasurer and Inspector of Mines, in which they were informed of the registration of the transfer for which Snell petitioned, and moreover declared the said land in the right possession of the named "Mining Company of the Orinoco."

That subsequently, and by petition Jan. 26 of the present year Edmundo Snell appealed once more to the executive power, asking the derogation of the aforesaid decree of Nov. 6, 1878, and that he should be reinstated on his legitimate dominion and possession of the concession No. 9, J. B. Austin, which was granted by decree, dated Feb. 28 last, which was submitted to the Legislative Assembly, and approved in session of March 15, according to the special note included in the documents—that sold by public auction the properties of the bankrupt company of the Orinoco by C. C. Fitzgerald, among which there is the concession No. 9, and transferred afterwards with the consent of the creditors of the estate to the Nouveau Monde Company, which, through their superintendent, Mr. Bickford Anthony, applied to the executive power, asking for the approbation of the transfer of the mining concessions, which form part of the aforesaid properties, according to the disposition of Article 75 of the code of mines, and not having his application attended to, and at the same time, according to the testimony of Mr. Anthony, the executive decree of Feb. 28 came to his knowledge, which decree deprives the company which he represents of one of their most valuable properties, he addressed himself anew to the Citizen President of the State, in documents dated March 17 and May 6 ult., adducing not only the title to the property of concession No. 9, which the company which he represents possesses in virtue of the certificate of public sale by auction and documents of transfer, which he has produced, but also the destitution of right on the part of Snell to dispute to them the referred concession, annexing at the end of their petitions authentic documents, which prove that the company of the Orinoco exerted acts of full possession upon the concession No. 9, after the date in which Snell says that the aforesaid concession was transferred to him without his having offered any obstacles or opposition whatsoever;

and, finally, as it has been asserted, and the executive power has acknowledged, that there were in this case interests in dispute, the executive power abstained to adjudicate upon the several appeals of the superintendent of the Nouveau Monde Company, of which reference has been made, and submitted the decision of the case to this Supreme Court.

Looking, therefore, to the antecedents which, as above have been stated, the Court observes:—That the question which has caused the present controversy having reference to the recovery of a property in which the company of the Orinoco possessed just titles, and which have been transferred to the Nouveau Monde Company by means of the sale by auction and subsequent transfer made in their favour by the seller, Mr. C. C. Fitzgerald, it follows that this question is not comprised in the Article 92 of the Code of Mines in force, according to which the President of the State is only empowered to decide the disputes which may arise between the holders of concessions upon transitory possession, and of police or inspection in the working thereof, based on the prescriptions of the same code; whereas, the present dispute is not about transitory possession, nor of police, between the holders of mines, as Snell had not that character, and the point to be decided was not based on the prescriptions of the Code of Mines, when at all events, for arriving at a decision, appreciations had to be considered according to common law. For these reasons the executive power, adjusting its proceedings to the precept contained in the last part of the aforesaid Article 92 has given a proof of its respect for the law, and acknowledged the competency of the Courts of Justice to deliver judgment in a case evidently of contentious nature, and which, besides being in conformity to the legal rules as aforesaid, it was required in equity, as is established by the very executive power in its decree of May 19 ult., from the fact that in the course of the case documents have been presented which could not have been taken into consideration in the issuing of the executive decree of Feb. 28, and which would be considered or taken into account in an ordinary court of law if the case was brought before such a Court.

It has been demonstrated that the named decree of Feb. 28 last did refer to a question which was not of the competency of the executive power, therefore was without effect, and as such it gains no force whatever by the approbation of the Legislative Assembly, because having trespassed upon the functions of the judicial power such act can produce no effect whatsoever, according to the clear disposition of Article 104 of the national constitution.

Proceeding now this Court to examine the merits of the titles of the property produced, it finds that those of the Nouveau Monde Company consist of authentic documents, and in the form prescribed by the laws, whereas those of Edmundo Snell, even leaving apart any analysis as to the terms in which they are conceived, they are short of the formality of the registry expressly required for its legality according to the Article 75 of the Code of Mines in force. In virtue of these this Supreme Court administering justice in the name of the United States of Venezuela, and by the authority of the law declares, in conformity with Article 92 of the said Code of Mines, the mining company Nouveau Monde to have sufficient right to preserve and retain the actual possession of the named concession, J. B. Austin, No. 9, leaving to Edmundo Snell his free right to appeal to an ordinary court of law if he deems it convenient.

Let this decision be made public, and notice thereof given to the executive power of the section of Guayana, accompanied by the original documents for its legal effects, and let there be kept a certificated copy of this resolution.

R. BARRIOS, PEDRO G. MONAGAS, F. OLIVARES.

Published in the same law court at three P.M.

F. OLIVARES, Chancellor.

It is an exact copy. Dated *ut supra*

LUIS FANDEL, First Official.

THE KAPANGA GOLD MINE.

SIR,—It is a pity the directors do not send out a few of the letter-writing shareholders and croakers to manage this property. A few of them also would render great assistance and be equally valuable to General Gordon in the Soudan. Mr. Baker tells us, in a recent letter, that he submitted a wise plan to the secretary, and that that civil and courteous gentleman never answered his letter; but as some of the plans submitted might have involved the "burning of the Thames at Coromandel," it was too stupendous an affair for the secretary to grapple with, and thus the mighty discoveries evolved by the gigantic intellect of Mr. Baker have been lost to the world, and future generations will weep at the incalculable loss sustained in consequence of the secretary not carrying out Mr. Baker's plans. What can the directors be about? Why do they not send out Mr. Baker to manage the mine? I think that Kapanga from the beginning has been managed with sound judgment, practical skill, and also systematically and scientifically, and I know that not a shadow of a charge can be brought against the manager except "that he cannot create gold." But no miner will attempt to say that the best plans have not been carried out for finding the gold. Gold was found in large quantities in Old Kapanga, and a little more perseverance may discover large quantities again, and the present plan of operations will find it if it exists, and in the explorations for it the manager contributes a considerable share of the outlay. OLD MINER.

Cork, Feb. 19.

WEST AFRICAN GOLD FIELDS COMPANY.

SIR,—I was in hopes that my letter and that of "W. S. R." in the Mining Journal would have had the effect of drawing from the directors of the West African Gold Fields Company some kind of information about our property. I write constantly to the office enquiring what has become of my money, but can get no answer. When I invested in this undertaking I did so not only on account of the statements made in the advertisement, but also because I considered that the names of the directors were a guarantee to me that these statements were true. None of them have proved to be so, the sale for 40,000*l.* of part of our property has not taken place. The dividends "in six months' time" have not been paid.

Are these gentlemen who pledged themselves to the truth of all these statements, and whose names are signed to the advertisement, on the faith of which we gave them our money, aware of the position in which they stand? I cannot believe it, otherwise they would come forward and explain what so much needs explanation. I am determined for my own part to see this matter out, and if any of my brother shareholders are of the same opinion, and will say so, I think I may be able to show them how we can help one another.

Feb. 19.

W. S. P

FRONTINO AND BOLIVIA GOLD MINES.

SIR,—In reply to "Enquirer" as to what I mean as regards these mines and Australian gold mines, I can readily explain, though I am not connected with gold mines, nor, indeed, with any other mines. In Australia no doubt heavy machinery can be moved and set up, and thus power may be very cheap to effect the crushing and amalgamation of quartz. At Frontino I believe only such machinery can be set up as can be carried piecemeal on mules' backs for great distances. Also the wet season tropical rains are destructively heavy, and the dry season is, on the other hand, a great drawback, causing scarcity of water. Then also the holidays occasion serious delays, whilst sickness prevails very much amongst both men and officers. There is also frequently a scarcity of men to do the work, so that what costs only 3 dwts. of gold per ton in Australia may cost 11 dwts. in Bolivia. If "Enquirer" can point out to the directors how to get the gold out of the quartz for 3 dwts. of gold per ton I should say they would be only too glad, and would reward him handsomely.

Your correspondent "F. A. S. C." wishes to learn something about lead. The matter is a very simple one. Lead can be raised in Spain in any quantity, and sold in England, realising a handsome profit at 12*l.* per ton. If the demand for lead were doubled there would be only a temporary rise, for Spain would double the present imports in a few months, so that no hope of any permanent rise can be entertained, except by those who are always expecting a good time coming which never comes. Lead may rise, and pigs may fly.

The events are equally probable, and your correspondent will see both take place if either should eventuate. Duty free foreign lead is keeping the price down, and it may go down to 10L per ton and still yield a profit to the Spanish mineowners. Protection is the only hope for home lead mining.—Feb. 18. RECIPROCITY.

GOLD.

SIR,—“Gold Seeker,” from St. Stephen's Club, enquires in your issue last week who is now considered the principal authority on the extraction of gold and silver from quartz and other ores of the present day? This is a rather wide question, and one that may be difficult to answer satisfactorily to the enquirer, or to many of those who consider themselves authorities on gold mining, and the extracting of gold and silver from the ores or matrix. The old adage of “the proof of the pudding is in the eating” may be applied in this case as the best answer to the query of “Gold Seeker.” The best practical authorities on the extraction of gold are those thoroughly experienced men who have acquired their knowledge at the gold mines, and who have given proof of their ability by their work. It must be amongst the managers, engineers, or superintendents of gold and silver mines in America and Australia where the best proof can be obtained, as to the ability of those who may be classed as practical authorities on the extraction of gold.

It is not always in the rich mines that the most skill and economy is shown either in the management of the mine or the extraction of the gold from the matrix, but the best tests are where low grade ores are made to pay good profits. As an example of economical and profitable mining and saving of gold take the mines at the Black Hills, Dakota, United States of America, such as the Homestake, Deadwood Terra, Father de Smet, and others, where the results from mining and milling 1,512,037 tons of ore were \$10,434,116, being an average of \$5.78 per ton, making a profit and paying dividends of \$3,142,500, the total assessment being only \$400,000. I have not the pleasure of the acquaintance of any of the superintendents of those mines, but their doings are enough to satisfy me that they may be classed as authorities on the extraction of gold. Scores of similar authorities might be found in America amongst the experienced managers of gold and silver mines that are now producing such an enormous output of the precious metals in that country.

Then, again, in Australia there can be reckoned a long list of experienced authorities, from the managers of the many mining companies now in profitable work, such as Mr. Bland, of the Port Phillip Co., at Clunes; Mr. R. M. Sargeant, of the Bland and Albion Consols Co., Ballarat; Mr. Rossella, of the Long Tunnel Co., Waltham, Gipps Land; the managers of the Pleasant Creek Cross Reef, Stawell; Garden Gully United Co., Sandhurst; Great Extended Hustlers Co., Sandhurst, and others; or the managers of any of the large crushing mills in that district or at Ballarat. The manager of the Black Horse Mine, Egerton, Victoria, which makes 500L per month profits, and is paying dividends at the rate of 50 per cent. per annum on the capital 12,750L, on quartz averaging only 3 dwts. of gold per ton, may be considered a good authority; or Mr. Wm. Nicholas, F.G.S., one of the directors of that company, and who is a mining engineer of repute, and lecturer on mining at the University, Melbourne. Any of these gentlemen if applied to would no doubt give information as to the process they severally adopt.

GOLD MINER.

CANADIAN MINING, RAILWAY, AND GENERAL INTELLIGENCE.

SIR,—The Parliament has again met at Ottawa, and the chief business of the Session will be the Canadian Pacific Railway. On account of the hostility of rival lines, particularly the Grand Trunk Railway and Northern Pacific and Union Pacific, statements were made so far below the truth that the directors have been compelled to come to the Government of Canada to help them through with their project, and to finish the line to the Pacific Ocean five years before the contract requires.

The fact of it is the whole Government and people of Canada are determined to build the Canadian Pacific, and to finish it to the Pacific as soon as possible. There is no doubt that the arrangement will be carried out, and that the company will get the assistance required. Practically it is a Government road, although theoretically it is built by the Canadian Pacific Railway Company. The Government gave the land and the money, and the company manipulated it. It is for the interest of Canada that it should be built; it is for the interest of England; it is for the interest of Australia, and the whole British Empire. Canada proposes to build it, and to build it out of the land of the North-West, and this is the way we do it. Already the iron horse is champing at the foot of the Rocky Mountains, and it would show little manhood or courage if the Canadian people allowed the false statements of rival railroads to put a stop to the onward progress of the Canadian Pacific.

MONTREAL.—The great Winter Carnival at Montreal is now attracting all the youth and beauty of this part of the Continent. The New York and Boston people, with their sleighs and horses, are coming. The great drive on Wednesday, the 6th, is advertised to consist of 5000 sleighs. Vanderbilt and his party have taken 80 rooms in the Windsor Hotel, and all the Pullman cars that could be spared are going. I send you a pamphlet which will give you some idea of the pleasures of frost and snow.

SIR,—As the readers of the *Mining Journal* are men in all parts of the world interested in everything which tends to increase the power of civilisation by developing the resources of different countries, I thought an account of the Turkish Mission would be of value. If Trollope's autobiography is worthy of credence the system of education in England is one apart from the study of geography. The knowledge of the geography of the Peloponnesus, Asia Minor, Egypt, and Palestine is quite sufficient for a Fellow of Cambridge and Oxford, but our Fellows in America would be little appreciated, and would be continually “declining and falling off” (like Boffins in “Our Mutual Friend”) unless they were better acquainted with modern geography. The old system of starting a boy with the invasion of Greece by Darius and the description of the battle of Marathon, carrying him through Grecian and Roman History and leaving him at Constantine the Great, commencing again at the invasion of England by William the Conqueror, causes a hiatus in his education which is seldom filled. The American system begins at the present time and present place, and goes back. Perhaps it may not appear so erudite, but it is certainly more useful and less likely to call up the blush of ignorance. The idea of having no supports in the middle levels of the mine, and having all the supports below and above does not appear to be good mining.

BOURONITE

Arnprior, Canada, Feb. 1.

CANADIAN COPPER AND SULPHUR COMPANY.

SIR,—It is a matter of great surprise to many shareholders that the balance-sheet for the year ended Sept. 30 has not yet been issued, although two months later than usual, and nearly five months since the books of this now very small concern were closed for that year, and the object of the directors in withholding the information is being very adversely criticised. It is stated that the mine cannot be made pay, that the whole of the money raised upon debenture has been spent, and that the object of the delay is to enable them to present a scheme for the manufacture of sulphuric acid by the formation of another company, with the object of covering the fact that the copper mine cannot be made to pay as at present. Some time ago Mr. Bird, a director, issued a circular after visiting the property, and in it he said that “from the first named mine (Hartford) ample supplies of ore can be obtained to employ the present smelting-works to their full capacity. These works appear to be fairly well adapted to their purpose, and sufficient for moderate requirements, but as we have at command a very large supply of ores of good quality a much greater amount of regulus could be produced had we the additional plant for treating these ores.”

Now, the ostensible reason before why the company was unsuccessful was that they had no ores; now they have more than they can use, and yet the mine does not pay. When and how, then, is it to be made pay? Again, Mr. Bird writes:—“I now come to what I

consider to be by far the most important part of the whole matter. I learnt, in the course of my enquiries, that we have not hitherto been able to utilise our ores to anything like the extent to which they are capable, which we, at present, limit to the extraction of the copper which they contain. The ores from the Hartford Mine, however, contain a very large percentage of sulphur, which, by the employment of proper condensing apparatus, can be readily converted into sulphuric acid.” The manufacture of sulphuric acid, it now appears, is more important than the getting of copper. By all manner of means let them form a company to utilise the sulphur that at present goes to waste; but that will not benefit the copper company very much. I doubt, if so, the directors have been very long in moving in the right direction.

The last quotation from this contradictory circular is that “the proprietors are doubtless aware that the capital raised by the present management, by the issue of debentures, to assist in the more profitable development of the property, has been entirely and successfully expended for that purpose. The concern has thus been saved from collapse, and the shareholders have been enabled to retain possession of a property which, by the moderate contribution of the debenture-holders, there are such good reasons for believing may be made most valuable. It is on these grounds, that having benefited by the expenditure of the debenture capital, the shareholders should be now invited, in furtherance of their own interests, to subscribe to the proposal suggested.”

The whole of the debenture capital has been entirely and successfully spent. I believe it has been entirely, but I have yet to learn successfully spent, and the sooner the directors issue their report in that case the better pleased the shareholders will be. Mr. Bird, in closing his remarks, advocates the sale of the timber and surface grounds—the last available asset to keep the concern going a little longer I suppose. The usual tactics of the directors in the past will, I suppose, be followed this year also—to have the annual meeting two or three days after the report is issued, in case any discussion or action should be taken by the shareholders were longer time allowed.

Glasgow, Feb. 21.

B. B.

CANADIAN COPPER AND SULPHUR COMPANY.

SIR,—As we have not had any promising news from the manager of the above mine I presume he has none to send us. I certainly think the best course we can adopt is that of winding it up as soon as possible—the first loss will be the best. I received a circular from Mr. Bird sometime since, which I presume is a hoax. Surely this gentleman (if the circular were genuine) must think the shareholders are never tired of losing money. When I purchased my shares the amount paid was stated to be 4L per share, then it was reduced to 2L, which it stands at to-day, and the shares are selling a-fourth the price I paid for mine. I do hope some action will be taken at once.

Manchester, Feb. 20.

M. C. H.

GOLD AMALGAMATION.

SIR,—Mr. M. Parry Gosset's interesting letter on this subject in last week's *Journal* invites observation. Obviously it was not intended to have any reference to mine on the same subject which immediately preceded it in the column. The quotations from statements of Burchard, Paul, Fossett, Riechnecker, Eggleston, the Nevada Transcript, and the London Quarterly Journal of Science as to the loss of gold by the various processes in use for its acquisition from minerals, represent probably a close approximation to the truth. The annoying inference to be drawn from it all is that on the whole, no matter what method is adopted for the prevention of such loss, still a very considerable quantity of gold escapes capture. Up to this point I take it all persons addicted to the pursuit of gold getting from its matrices are pretty well agreed, excepting of course as to anything like uniformity of quantity lost. Mr. Gosset himself sums up the matter by “supposing that nearly 20 per cent. of the assay contents of free gold ores is invariably lost.”

I do not think this at all an unreasonable supposition, for mentally I have put it at more than that. The so-called loss, however, of that which one is unable to get is only a small fraction of an expectation. Clearly then an economic mode of saving this 20 per cent. is a desideratum of vast importance, provided always that too much is not paid for the whistle; and Mr. Gosset's opinion is that the wave-plate amalgamator is it. This fact ought to be, as I have before said, capable of easy proof. Perhaps it is, and candidly I shall not in the least repine if Mr. Gosset eventually proves it.

His communication, however, requires somewhat of qualitative analysis. The salient points are as follows:—

- 1.—Free ores, free milling ores, or most tractable ores (query, synonyms?).
 - 2.—Refractory ores or rebellious ores (synonyms also. Of course all are supposed to be auriferous.)
 - 3.—The great loss of gold heretofore by all known processes used in its extraction.
 - 4.—The salvage of everybody's loss by the wave-plate amalgamator, and consequent salvation of many gold mines now in existence.
- 1.—With regard to free gold ore, by which I understand quartz, &c., containing amalgamable gold easily separable from the silica, and from which by dexterous manipulation in any of many ways, the operator ought to obtain most of the object of his heart's desire, whether the game pays for the candle burnt or not. But if by free gold is meant any state of gold-being that is detachable from its various matrices by pulverisation, &c., it has never been held as fact I think that the entirety of such gold was attainable by amalgamation with ordinary quicksilver. The quicksilver may have happened to catch a moiety, or less or more, or none of it. I have made I may say thousands of experiments with large and small quantities of quicksilver, from which I know such to be the case, and that the variability of such work is well-nigh infinite, and certainly in most cases disappointing. Mr. Gosset's own assertion is—“The treatment of the free ores can be very profitably improved upon. Gold is found coarse and fine as flour gold, which latter is so light, owing to the state of fine division which it is in, that it either floats on the surface of the water or is carried away among the tailings and lost.” All this I verily believe.

2.—As to refractory or rebellious ores, as they are not at all appropriately called, as quoted by Mr. Gosset, Mr. Burchard says—“The simple truth is that the wealth of California lies in the so-called rebellious ores themselves, which are in no sense rebellious other than that the gold they contain cannot be extracted by any known free-milling amalgamating process any more than roast beef can be converted into chicken soup.” This is I fancy by no means an isolated opinion. Indeed it is thought to be generally admitted by gold millers. The admission, however, encourages the inference that if reduced to a state of infinite fineness the mineral dust may be auriferous without containing the slightest particle of amalgamable gold, and that on that account solely the contained gold will elude the power of ordinary quicksilver to catch and keep no matter how presented to it.

The mineral variations—such as float gold, flour, film, leaf, laminar, scale, paint gold, &c.—are modes of gold occurrence that are at times almost imponderable; and not only that are very often if not always tarnished with titanite acid, &c., so that if brought into even forcible contact with ordinary quicksilver are more or less rejected by it. Further there exist more frequently than is generally supposed what may be termed natural gold alloys, which are, *inter alia*, argentiferous, bismuthic, cupriferos, mercuriferous, palladium, platinumiferous, rhodium, stanniferous, and telluriferous. Also the recognised gold varieties—maldonite and porpezite, as well as the pseudomorphs after petzite, sylvanite, alkanite, and pyromorphite, with sundry other questionable states of being.

The chief known sources of gold (other than free or native gold) are frightfully suggestive of amalgamation derangements. Here are some of them:—Arsenolite, blende, bismuthinite, copper pyrites, covellite, chesylite, cuprite, galena, gossan, lapis lazuli (hadjyne), mispickel, malachite, marcasite, nagayagite, iron pyrites, stibnite, sylvanite, tetrahedrite, and tetradymite. With all these admitted gold associates, with the accompanying often of free arsenic and free sulphur, it seems not in the least improbable that there exist also gold arsenides, gold sulphides, gold antimonides, &c., and all of them antagonistic to amalgamation with ordinary quicksilver.

Foreign gold millers of large experience have told me regretfully of the unaccountable loss they have to put up with, and apparently without remedy. Nearly all seem to believe in the existence of gold in no other than a metallic or free state, and that, therefore, all gold is amalgamable. And yet strangely enough the contrary is well shown to them in the fact that they are not able to get all the gold by amalgamation in the ordinary way.

An honest assayer of pyritous matter for gold even when rigidly on guard all the while of the operation hesitates somewhat as to the correctness of his ultimate decision. All rich assays are really only approximations to absolute truth, and on occasions some of them are a considerable distance off it. In short no number whatever of nearness will ever actually touch the truth. An ordinary assay for gold is an easy enough operation, and it is obvious, therefore, that I am not hinting in the least at the incompetency of assayers in general. There are, however, particular (?) assayers, who carefully hand over the assays to rolicky boy apprentices, whose results right or wrong get certificates, and the consequent fees. Expectant owners get most unduly elated or depressed accordingly. I am not, however, just now contending with assayers and the use thereof in the matter of gold getting. I only here contend against any attempt to put the results of a fire-assay of pyrites, &c., in comparison with the results by amalgamation with ordinary quicksilver. Similar conditions for the trials can never be had; *ergo*, the results are always capricious, and, therefore, of little or no commercial value. Of course, I allude to the employment of quicksilver *per se* without the application of electricity, &c., in any way. Indeed I should not be writing this if it were not confidently asserted that the whole of the contained gold of pyritous minerals as *per fire assay* is attainable by ordinary amalgamation.

3.—As to the great loss of gold heretofore by all known processes, there is no question as to this being fact. I have never heard it doubted. On this head there was scarcely need of more specific testimony, for as Mr. Gosset says—“The real question at issue is how to remedy the evil,” and he further remarks, “I do not presume to take credit for my investigations, but at the same time it cannot be too well known that a remedy has been found.” The only observation I have to make on this head is that up to this time his investigations seem to have been limited to the judging of the testimony of others, which does not appear to have been explicitly enough given before the publication of his judgment, although standing on the threshold of that syren guide of life—probability. But probability always will necessarily attend on speculation of all sorts, for when we use the knowledge, observation, and experiences of others we in effect create not matter of fact but of speculation or testimony only. And to have absolute confidence in any testimony whatsoever we ought to be fully assured that the evidence given refers to a matter of fact undoubtedly ascertained by the witness, and that he had complete opportunity for thoroughly ascertaining. It is important also that there exists no reason for suspecting the witness in his evidence to be under the influence of personal interest of any kind. Further it would be of advantage that sundry independent witnesses above suspicion of bias should concur in the same statements or as nearly as possible thereto, and that there should appear a particular if not striking uniformity of character in the evidence adduced. Above all that there should be total absence of contradictory or even conflicting evidence. In addition to all this it would be by no means amiss that there should be a corroboration of testimony from our own knowledge of similar facts or facts somewhat similar, which, although perhaps not bearing exactly upon the statements to which the testimony refers, cannot be accounted for on any other supposition than his conviction that the statements are true. Fortified gradually in this way assurance generates into positive belief of the fact asserted. At any rate some such mode as this is absolutely necessary before complete acquiescence can result.

4.—As to the salvage of everybody's loss. Mr. Gosset says—“The wave-plate amalgamator will save all this. It has done so, and is doing so.” “The gold saved has been computed by competent authorities at the rate of cent. per cent.” This is positive assertion, and the onus of proof lies with Mr. Gosset. I wish to believe it, and I wait for Mr. Gosset's assurance as a chemist, from his own knowledge, that it is possible by Mr. Moon's apparatus or anybody's elses with ordinary quicksilver to obtain from arsenical pyrites and its so-called refractory associates all the gold and silver contained in them, whether amalgamable or otherwise. If this can be done there can be no question whatever as to “the salvation of many gold mines now in existence,” and it might be added, the resuscitation of many that have been accounted hopelessly dead for many years.

Mr. Gosset will not take offence I think at my particularity as regards the letter referred to; for although he does not allude to me or Mr. Moon in it, still in his former letter he stated to the effect that my pleasantry was calculated to mislead unless he, in Mr. Moon's absence, offered testimony such as he possessed.

In the Mineral Gallery of the Natural History Museum at South Kensington, case No. 2, is a rich specimen of refractory gold ore, marked Llanelyd, upon which is spectrum of the finest visible kind. Mr. Moon, the late Mr. Belt, and numerous other mining experts years ago tried their hands at extracting the gold from the mixed minerals from which this specimen was taken. Some of the stones in my own knowledge held gold at the rate of hundreds of ounces to the ton. Yet everybody then failed at its economic extraction; the loss of gold in one way and another was certainly much more than cent. per cent. beyond the gain. Here is a capital opportunity for Mr. Moon to reap the spoils of victory, by the application of his invention.—London, Feb. 14. T. A. READWIN, F.G.S.

SIR,—Mr. Gosset having in part frankly answered my letter of the 2nd inst. I am obliged, and am quite sure he will not for a moment think that in my communications I intended offence to him, Mr. Moon, or anybody else. The question is outside personality altogether. It is whether the whole of the contained gold in crude arsenical pyrites, &c., as shown by fire assays can be extracted by amalgamation with quicksilver in its ordinary or pure condition. In my judgment and in that of very many others of far greater experience than my own, it cannot. I wish it could. However, after all our study and experiences what we know of gold in its natural states may be classed almost with the infinitely little. Consequently it would be most unwise to treat with indifference any reasonable suggestions as means to the end. It is no question of particular amalgamators. It is obviously of far more importance.

London, Feb. 21.

T. A. READWIN, F.G.S.

AMALGAMATION OF GOLD.

SIR,—I return this day to England for the purpose of bringing my amalgamator before the English public, and will thank you to let the readers of the *Mining Journal* know that its practical value has been proved.

I will not take up the valuable space in your paper to bandy words with Mr. Readwin on the above subject, but ask you to insert in an early issue the following certificates of what my machine has done for months past, and is doing up to this day. I hope the importance of this success will be sufficient excuse for my asking the favour of allowing them to appear. They are all dated from Conrad Hill Gold and Copper Mines, McKee, Davidson County, N.C.

Mr. Jas. E. Clayton (Oct. 6) writes:—“We have used your wave-plate amalgamator at these mines for over two weeks, and the result of our various trials has been very favourable to your machine. Your amalgamator saved a very appreciable amount of gold from the pulp that had passed over the amalgamating plates. In working the pulp direct from the battery your machine saved more gold per ton of ore treated than batteries using the plates. In working ores which had been roasted (for the extraction of copper) your amalgamator has done much better work than the batteries with plates, or the pans. From our present experience I consider your amalgamator for simplicity of construction, regularity of work, and results obtained, as the most efficient and economical amalgamator of which I have any knowledge.”

Mr. Jas. E. Clayton (Feb. 2) writes:—“We have been using your amalgamator at these mines continuously since my letter to you of Oct. 6, 1883, and I fully endorse all I stated in that letter. We have also tried your amalgamator when the tailings from the stamps had passed over the plates, and find we can with your machine save an

additional and profitable amount of gold, which has escaped amalgamation. I consider your machine as the most valuable of any of which I have any knowledge.

Mr. John F. McKee, superintendent (Feb. 6) writes:—We have had your amalgamator in daily use since September, 1883. We have found it so simple and durable in its construction that for nearly five months it has done its work regularly, without causing us an hour's delay or annoyance, and requiring scarcely any attention. The result during this period has continued as favourable to your amalgamator, and as satisfactory to us, as stated by Mr. Clayton in his letter of Oct. 8, 1883. I wish you every success.

Mr. Jos. Ninnis, assayer (Feb. 6) writes:—Your note of yesterday to hand enquiring about assays of tailings from your amalgamator. It is only occasionally now that I make any tests for gold of the tailings in question. The results for the first two months, when samples were regularly taken, proving so uniformly satisfactory as to make the continuation of such unnecessary. The machine continues to do practically clean work.

I need scarcely say that immediately after my arrival in England I shall make arrangements for enabling all interested in gold extraction to judge for themselves. HENRY MOOX, M. E. (of Leicester.)
Thomastown, N.C., Feb. 7.

FREE TRADE, AND ITS RESULTS.

SIR,—In dealing with this great question, of vital importance to the nation, it will be well to bear in mind the fact that the Free Trade measure was carried through Parliament in a panic and in the excitement of a political race for power between Lord John Russell and Sir Robert Peel. The British tariffs had been lowered by these great statesmen quite deep enough in face of the high tariffs of other nations, but owing to the exigencies of party and a periodical call on the benevolence of England on the part of Ireland during the potato disease, England rushed into the vortex of one-sided Free Trade, whilst all the world besides moved prosperously on with protection.

What would Sir Robert Peel think if he were now living and at the head of the Government, and found that notwithstanding the unparalleled advantage to the nation caused by the influx of 20,000,000l. per annum from the discoveries of gold in America and Australia for nearly 30 years, the extraordinary commerce arising from the great wars of France, Germany, Austria, Italy, and America, and the vast quantities of iron exported for railways throughout the world. Agriculture at home had failed, landowners had to sacrifice in some instances half their rental, land in Essex, North Wilts, Hertfordshire, West Sussex, Somerset, and elsewhere tenantless, and 1,000,000 acres altogether gone out of cultivation? And what would be his astonishment to find also that besides this distress in agriculture the workshops and factories of Birmingham and Manchester, Leeds, Sheffield and Rochdale were seeking earnestly for Reciprocity and Fair Trade?

According to reliable statistics, obtained by Sir E. Sullivan, Mr. W. J. Harris, and other good men and true, who have stood nobly up for the industry of their country, a decline in our export trade is continuous, and with Germany it has reached 25 per cent., Holland 35 per cent., and America nearly 30 per cent. In 1872 England sent to the United States alone woollen and worsted goods to the extent of 5,600,000l.; in 1880 this branch of commerce had dropped to 2,200,000l. With high tariffs, trade with Germany also presents a remarkable aspect. In 1872 the exports of worsted and woollen goods amounted to 8,600,000l.; in 1880 they had fallen to about 1,100,000l. To show how much England depends on her export trade, it should be mentioned that the annual manufacture of cotton is estimated at 1,250,000,000 lbs., of which 250,000,000 lbs. only are consumed at home, the remaining 1,000,000,000 being for foreign markets. During the late recess visitors to England would naturally be led to suppose, from the speeches delivered by a certain class of political orators, that the enfranchisement of a host of idle Irish agitators in the midst of open rebellion was a real and absolute necessity. The Statist, not without reason, observes that the first act of a Home Rule Irish parliament would probably be to place a heavy tax on all English products imported into their happy land.

It would be interesting to learn how many of the political enthusiasts who have been recently wandering up and down the country delivering wild orations for the guidance of the public are aware of the fact that, whilst England has the greatest difficulty to bring Spain to anything like a sense of friendly dealing, a whole fleet of ships is constantly engaged in carrying tens of thousands of mineral annually from her shores to England duty free, whilst the very life of English mining is being crushed out by this grave national delusion of one-sided Free Trade.—Feb. 19. ARGUS.

FREE TRADE, AND THE INDUSTRIAL PROSPERITY OF IRELAND.

SIR,—I have read with interest the articles on the above subject, in particular that of Sir Edward Sullivan, in the *Mining Journal* of Feb. 2. I do not think, however, that he has established his theory—that it is owing to the withdrawal of the Protection duties on Irish manufactures that Ireland is sinking in the scale of nations. That this may have an important bearing on the subject may be, but I am of opinion that to get at the root of Ireland's troubles we must dig far deeper down than the cessation of the protective duties. As the history of the country is of importance to the theory hereinafter to be advanced, the following particulars of that history will, in the interest of general readers, not be out of place:—Ireland was first inhabited by Partholuan and 1000 soldiers about 2048 B.C. Nemedius, with 30 ships and 1200 men, reaches the island about 1740 B.C.; he engages in a war with African pirates, but is defeated. Their conquerors prove such tyrants that under the leadership of the three grandsons of Nemedius—Simon Breac, To Chath, and Briatan Maol—the greater part of the Nemedians leave their land. Descendants of Simon Breac, headed by five princes, return and found the five kingdoms of Munster, Connaught, Leinster, Meath, and Ulster, about 1400 B.C. These were totally overcome by Gadelius about 1300 B.C. Agricola invited to make a descent on Ireland on account of confusion and barbarities prevalent about 80 B.C. Christianity was introduced by St. Patrick 432 A.D. Danes invaded Ireland 800 A.D. Brian Boroiu defeated them at Clontarf 1014 A.D. It must be borne in mind that the ancient history of this country is involved in great obscurity, and up to A.D. 432 can only be taken from Irish historians.

A careful scrutiny of these particulars will result in our observing that from the arrival of Partholuan to the defeat of the Danes at Clontarf we have several periods, varying in duration, in which no fresh blood is introduced—from 2048 to 1696 B.C.—800 years. Then, after the arrival of the Nemedians (40 years later), no blood is imported till 1480—a lapse of 216 years. A period of almost another 200 years passes by before the next invasion takes place—in 1300 B.C.—under Gadelius. From this period to about 800, when the Danes invaded it, the country is unnoticed, or at any rate unvisited by any foreign race for more than 2000 years.

It may be said that I have taken no notice of the introduction of Christianity. I have not done so, as history shows that Christianity, although, perhaps, laying the foundation of a future civilisation by instilling a knowledge of letters, &c., exercised no real or practical influence as a whole. Now, Sir, let us take the first period (800 years), and enquire what must the result be of planting a body of about 1000 savages upon a wild, deserted island, cut off from any civilising influences, with neither knowledge or moral code to restrain them from the evils of intermarriage? Recollecting the truth, that constant intermarriage of degenerate stock produces still more degenerate stock, generally speaking, and applying what has been said above to the longest period of stagnation (2000 years), surely there can be but one answer to the enquiry—that the result must be a state of gross savagery.

As time advances, and the more modern history of the country commences, although we find civilisation making some impression on the eastern coasts and settlements, the great mass of the people in the now western parts of the island are not affected, and the same scenes of bloodshed, rebellion, rapine, and confusion prevail, in a greater or less degree, till the iron hand of Cromwell taught the

Irish their first lesson in obedience. I hold that the doctrine embodied in the old proverb, that "What is bred in the bone must come out in the flesh," is a thoroughly true one; and it is from the application of this doctrine to the consideration of the facts which have been advanced that, I think, the true cause of Ireland's woes will be found. Her people, for upwards of 3000 years, have been a roving, intercaste, more or less, savage race. For the confirmation of this we have only to turn to the history of the country for the time just preceding the English invasion under Henry II., and see what a scene presents itself to our gaze, the result of intermarriage of bad stock!

"The wars with the Danes were no sooner at an end, than the natives, as usual, turned their arms against one another. The country was harassed by the competition of the chiefs; laws and religion lost their influence, and the most horrid licentiousness and immorality prevailed." And yet, with these facts in our possession, we imagine we are going to discover an immediate panacea which will cure Ireland of all her ills. No, Sir, the first thing to be done is to encourage by every possible means the intermarriage of the pure Irish with other races, and the establishment of small settlements of Scotch and English in the more remote districts to promote this. This is what is wanted to really ameliorate the condition of the Irish people. Hand in hand with this must, of course, go a firm, just, impartial administration of the law by a Government who can appreciate the clear-sightedness and cool judgment of such men as Mr. Foster, instead of pandering to the inherent badness, laziness, and idleness bred in the pure Irish people. Sir Edward Sullivan indirectly bears me out in my theory, for he asks—"How is it that the Irish race, who steadily sink lower and lower in Ireland, rise with a bound to prosperity and civilisation in Canada, America, and Australia?" The simple and primary answer, it seems to me, because they mix with other people, in the course of time intermarry with them, and thereby improve the race.

I do not agree either with those politicians who think the only thing to save this unfortunate country is to "keep a strict hand over her," or with those who preach the suicidal doctrine of "Ireland for the Irish," but think that, provided the idea of the improvement of the Irish race is kept clearly in view, a middle course should be taken, steering clear of the Scylla of pure coercion on the one hand, and of the Charybdis of Home Rule on the other. H. G. S.
Clapham, Feb. 20.

WORKABLE COAL NEAR LONDON—THE RICHMOND TOWN WELL.

SIR,—A few years ago attention was drawn to several important borings for water which had been made in the neighbourhood of London, and occasion was taken to point out the connection between the results attained by these borings and the probability of finding coal at a workable depth within a short distance of the Metropolis. The boring at Meux's Brewery, after passing through the great oolite, suddenly entered a vastly older strata in the Devonian or Old Red Sandstone beds. Taken in connection with the boring at Kentish Town, and another to the north-east, at Harwich, it was pointed out that a ridge of rocks, older than the coal measures, passed under London, being probably an underground continuation of the Mendip Hills, in Somersetshire, north-eastwards towards Harwich, and it was suggested that borings put down at some distance to the north-west or south-east of this underground ridge might strike the coal measures, or strata, connected with them.

Some interesting light has been thrown upon this question by the recent deepening of the town well at Richmond, Surrey, from 434 ft. to a depth of 1310 ft. Throughout its entire depth the boring shows a thickness of Tertiary strata—London clay, 160 ft.; Woolwich and Reading beds, 60 ft.; and Thanet sand, 23 ft. These beds present their usual features, and they are separated from the underlying chalk by the usual band of green-coated flints. The chalk was 671 ft. thick, and the gault 207½ ft., both presenting their usual divisions, characteristics, and fossils. Next came an impure sandy limestone, of Neocomian age, 10 ft. thick, and then the boring entered the thick limestone beds of the great oolite, which proved to be 87½ ft. in thickness. At Meux's boring they were 64 ft. thick. These oolitic limestones rest at Richmond, on variegated sandstones and marls, which evidently belong to the lower portion of the New Red Sandstone; the intervening lias and upper portion of the New Red being absent. It is interesting to note that the water issuing from these beds, which lie at the base of the great salt deposits of this country, contains, at Richmond, 26 grains of chloride of sodium (common salt) per gallon. The boring has entered these red beds about 50 ft., and has, therefore, reached a point nearer and above the coal measures than any previous boring in the South of England. At Meux's Brewery, as has been stated, the boring, after passing through the limestones of the great oolite, immediately entered the Devonian beds, which lie some thousand feet below the base of the coal measures. The Richmond boring is, therefore, some distance to the south-east of the centre great ridge of older rocks, and the strata seem to be attaining their full sequence. It is probable that if not quite at this point, at a distance of a mile or so to the south, a boring or sinking would ultimately enter the coal measures. The depth at which this result would be attained depends upon the question whether the strata intervening between the bottom of the Richmond well and the coal measures—that is to say, the base of the New Red Sandstone and the Permian beds—are present in their full force. The Richmond sinking is 436 yards deep, and it is possible that, at double that depth, or (say) 900 yards, the heart of the coal measures would be reached. As we have already coal pits nearly this depth, there is nothing impracticable in the way of winning coal from a depth of 1000 yards. The time may, therefore, come when our present coal fields having to be worked at greater and still greater depths, a fresh and vigorous effort may be made to find coal under the newer strata of the South and East of England. D.
Oswestry, Feb. 21.

HOW MUCH IS DOLCOATH IN DEBT?

SIR,—Is Dolcoath 15,000l., 20,000l., 25,000l., or 30,000l. in debt? This question is asked over and over again both in and out of the county. Do the executive know themselves? Do the committee and executive consider the shareholders have a right to know? Is the mine the property of the adventurers or solely the property of the executive? Does this mine comply in any degree with the provisions of the Stannaries Act of 1869? Section 9 is as follows:—"The purser of every company shall once at least in every four months truly enter in the Cost-book of the company accounts showing the actual financial position of the company at the end of the financial month of the company last preceding the time of entry, including a statement of all credits, debts, and liabilities, and distinguishing in such accounts the amount of calls paid and calls not paid, with accurate lists of all the shareholders for the time being in the company," &c. Probably after the recent exposures of accumulated debts in Cost-book mines, varying from 10,000l. to 20,000l., the attention of Parliament will be called to the necessity of further amending the Act above referred to, and compelling under penalties the keeping of true and honest accounts. It should also be made compulsory that a full statement of the account should be issued quarterly, including a copy of the cash account and a list of merchants' bills, giving the dates of such bills. A strong measure of this kind seems absolutely necessary in order to sustain mining at the present juncture, and is equally necessary with a reform in mineral rights. Little faith is now put on mine accounts, and one may be led to ask if a poor mine is allowed to run in debt to the tune of 20,000l., how much can we allow a rich mine to go in debt? In Dolcoath there is an admitted debt of 5380l. which was advanced to the miners from time to time. There is also the sum of 9855l. due to merchants under the head of liabilities up to date charged, and not paid in cash, and who knows how much in merchants' bills still remain to be charged. Why should there be this concealment? Is there still a heavy amount kept back? If the debt is not a heavy one what occasion is there to hide it? Unquestionably there is a debt, and for what purpose was it allowed to accumulate. Were the management less honoured and respected it might lay open to the suspicion that the sole possessor of the secret is a manager's perquisite to manipulate the price of shares, to leave out bills in order to show a

large profit, or if the occasion suits to charge up accounts and bills at any given time for depressing prices. Human nature is fallible. Is it right that one man should have this power over a company representing a money value of over 260,000l. I contend that every shareholder has already under the Stannaries Act the legal right to know the financial position of the mine.

Confidence in Cornish mines can never return until shareholders are treated fairly. Many good shareholders and much capital have already been driven out of the county by the late financial bungles, and it will take some time yet under needful reforms before the belief of many is dissipated that too much attention is given by some managers in maintaining and keeping up the price of shares, and too little attention to economically working their mines for the benefit of their employers—the shareholders. VERITAS,
Redruth, Feb. 14.

ROYAL MINES.

SIR,—Your correspondent, Mr. G. R. Brown, asks what the law as to precious metals is in the United Kingdom. The only mines which are termed Royal, and which are the exclusive property of the Crown, are mines of silver and gold. And this property is so peculiarly a branch of the Royal prerogative that it has been said that though the King grants lands on which mines are, and all mines on them, yet Royal mines will not pass by so general a description. This prerogative is stated to have originated in the King's right of coinage in order to supply him with materials. Whatever reason may be assigned for this right of the Crown, and of whatever value that right may be, it has been long decided not only that all mines of gold and silver within the realm though in the lands of subjects belong exclusively to the Crown by prerogative; but that this right is also accompanied with full liberty to dig and carry away the ores, and with all other such incidents thereto as are necessary to be used for getting them.

It seems formerly to have been a matter of considerable dispute as to what constituted a Royal mine. By some it was considered to be a principle of common law that if any gold or silver was found in metals of a baser nature that was sufficient to bring the mine within the definition of a Royal mine, while by others a mine was not to be deemed Royal unless the quantity of gold or silver exceeded in value that of the other metal in which it was mixed. The right of entry in search of Royal mines was oppressive in the extreme, for no damages were paid, and any mine which might have been discovered at great expense and after infinite labour seemed liable to be claimed as a Royal mine. Valuable mines were concealed, and there was universal distrust. Such a state of things called loudly for a legislative remedy; this remedy was at last afforded. An Act was passed declaring that no mine of tin, copper, iron, or lead should thereafter be taken to be a Royal mine, although gold or silver might be extracted out of the same. The present state of the law in England seems to be this—that mines of copper, lead, tin, and iron containing gold can be worked without license or royalty; that the Crown cannot grant licenses for prospecting and working gold on private lands.

The following are some of the assays of gold ores of Wales, where no gold was visible with a microscope, treated by two processes, chemical analysis and electric analysis:—

	Chem. anal.		Elec. anal.
	Ozs. dwts.		Ozs. dwts.
Oxides of iron.....Per ton	3 10	.....	3 10
"	1 16	.....	1 16
"	5 2	.....	5 2
Slaty iron sulphurets.....	3 0	.....	3 7
Quartz from Dolfrwynog.....	2 17	.....	3 1
Argentiferous galena.....	3 0	.....	3 0
Quartz, North Dolfrwynog.....	1 13	.....	1 16
Argentiferous galena, Cwmheisiau.....	2 18	.....	2 18
Sulphuret of iron, ".....	4 0	.....	4 17
"	2 13	.....	2 19
Quartz, lead, and blende.....	3 10	.....	3 14
Oxide of iron, Moel-yr-Weten.....	0 14	.....	0 14
Conglomerate, near Llanfachreth.....	0 13	.....	0 13
Earthy oxide, Tynyllwyn.....	1 18	.....	1 18
Lead ore, Hafod-y-fedw.....	2 0	.....	2 0
Quartz, Snowdon.....	3 12	.....	3 12
" Beddgelert.....	1 5	.....	1 16
Ferruginous conglomerate, Moel Siabod.....	0 17	.....	0 17
Argentiferous galena, Llanfrothen.....	1 19	.....	1 19

The gold localities known in Wales and referred to above are principally in Merionethshire. It is on record that a specimen of gold ore containing 330 ozs. of gold to the ton had been found at Snowdon; but the record goes on to say this was, of course, a picked specimen. Mr. St. Pierre Foley has ascertained the existence of gold at Hafod-y-Morfa, in the Prince of Wales Mines. See *Mining Journal* for 1853, page 464.—*Liverpool*, Feb. 19. JOHN SEABROOK.

THE SNOWDON DISTRICT, AND ITS MINES.

SIR,—I was sorry to see by your report from North Wales that the recent storm had played such havoc with the Braich-y-Oen Copper Mine on the sides of Snowdon. I was in hopes that the success of this little mine would be the forerunner of a series in the Snowdon district. When climbing the sides of Snowdon in the autumn of last year I was very much struck with the metalliferous deposits on either side of the Cwmllan river. I thought it a pity to see such riches lying undeveloped, and feel sure that, notwithstanding it is eight miles from a seaport, these minerals could be profitably worked. The lodes concentrate on the S.E. of Snowdon, as plainly shown at Braich-y-Oen. There is ample water-power for working cheaply, and there would be no expensive machinery required for pumping. The minerals can be worked by open quarry.

About a mile to the N.E. of Llewidi I came across some old workings, where thousands upon thousands of fathoms had been quarried out of the side of the mountain, clearly showing that at one time copper mining on Snowdon must have been very profitable or such tremendous workings would not have been carried on. Could they not be made remunerative now if worked in a legitimate way? As a geological study the S.E. of Snowdon is most interesting, but a great puzzle. The formation is felspathic porphyritic lavas and calcareous and felspathic volcanic ashes. A great sheet of the former lies on either side of Llyn Dinas, and rising in a steep escarpment on the N.W. dips under wavy beds of the same ashy material that forms the "Wyddfa" the Welsh name for the top of Snowdon—meaning the "conspicuous head." JOHN SEABROOK.
Liverpool, Feb. 19.

ST. AGNES MINERS' AND MECHANICS' LITERARY INSTITUTION.

SIR,—On Tuesday, with Captain Jas. Roberts, of this place, an old agent of Messrs. J. Taylor and Sons, and a gentleman who has visited every part of the globe where mining pursuits are carried on, I went to St. Agnes to hear a lecture given by Captain Bennetts on the "St. Agnes Mining District," under the auspices of the St. Agnes Miners' and Mechanics' Literary Institution.—Mr. Twite, the popular President, in the chair. Captain Bennetts' lecture showed evident deep thought; he confined himself chiefly to the district of Penhalls, and gave illustrations by sections. He spoke cheerfully on the mining prospects of St. Agnes, and predicted a great future for the district, which in point of geological formation was unique, and in the many changes and dislocations the lodes were subject to. His opinion with regard to a lode being moved by a cross-course, borne out by experience, was that the way to find the lode again was to suppose that the upper wall had gone down, which he had invariably found to be the case. He advocated sinking for the main treasures. With De la Beche he was inclined to think that the sands and clays about the Beacon were marine deposits, although few remains of anything of the sort existed in them. He used an expressive Cornish term in speaking of upheavals by volcanic agency, that the crust had been "poked up." An animated discussion took place after the lecture, in which Messrs. Hitchins, Opie, and others were engaged. To those interested in mining the knowledge must be gratifying that the St. Agnes Miners' and Mechanics' Literary Institution is in a flourishing condition, which in a great measure is due to the exertions of the energetic honorary secretary, Dr. Whitworth. Dr. Whitworth is a

son to the gentleman of that name whose demise has been recently referred to in the *Mining Journal*.
Perranporth, Feb. 20.

MINING AS IT SHOULD BE, WITHOUT RISK OR LOSS OF CAPITAL.

SIR,—Noticing in *Mining Journal* of Feb. 2 a letter from "D. D." headed "How Public Companies Should be Formed," it occurred to me that a plan by which investors might have the opportunity of speculating in mines without risk or loss of capital would be acceptable to the public at the present time when mining is so much discredited that without a new departure from the recognised course of obtaining capital it is next to impossible to induce anyone to invest in even the most promising adventure. My plan is simple, and consists of investing the money (now taken by promoters) for the benefit of the genuine investor to repay the capital subscribed. For example, say a company is formed with a capital of 70,000*l.*, in 7000 shares of 10*l.* each, let the vendors receive 10,000*l.* in fully-paid shares for their trouble and risk, and also take the 60,000*l.* subscribed by the public for the remaining shares, giving as a bonus bonds of 10*l.* each for the like amount (60,000*l.*), repayable by annual drawings of 4 per cent. (2400*l.*) each year.

Let the vendors agree to expend 25,000*l.*, as required in working the mine, and invest the remaining 35,000*l.* to provide for the annual drawings of bonds. Every shareholder, besides having his share, which he can sell when opportunity offers, holds his bond for the original amount paid, and which will be redeemed in one to 25 years, and all that he can possibly lose is the interest for a like period.

To carry out this plan and give protection and security to the bondholders, it is essential that a guarantee company with Limited Liability should be formed—say, capital 100,000*l.*, in 1*l.* shares—and call up 1*l.* per share, so that all may have a chance to assist. Let the guarantee company act as vendors of any property, and for remuneration take fully-paid-up shares. I believe this plan would bring mining into better repute, and give more employment to an industrious and deserving people.
EDWARD BETTELEY.

Leeds, Feb. 29.

THE VERY LOW PRICE OF LEAD.

SIR,—Allow me space for a few words in reply to "F. A. S. C.'s" letter in last week's *Mining Journal*. Production and consumption of lead are thought to be about equal, but absence of reliable statistics leaves us quite in the dark on this point. The stocks of pig-lead are, I believe, very small, which partly accounts for the depression in the trade; as, if the producers who are not strong enough to hold their lead otherwise, were to store it and obtain advances on the warrants, an improved market would most certainly follow. I firmly believe that if all the lead producers had reliable statistics placed in their hands they would see where the fault is, and come to the conclusion that the only way to improve the market is to hold—come what will. The depression in the lead trade, I am of opinion, is mainly due to the foreign mines having passed into weak hands, who, not being well financed, work them, as one may term, "from hand to mouth," which obliges them to sell their lead immediately on production to the highest bidder, regardless of the state of, or prospects of what holding out of the market may be.
Feb. 18.

LEADER.

WHEAL BENNY.

SIR,—For the information of Sir C. W. Craufurd, whose letter appeared in last week's *Mining Journal*, and of any others whom it may concern, I beg to say that I have by me, whilst writing, a lease for 21 years, dated Dec. 8, 1880, from Samuel Lang to myself and others of the freehold said to be granted to the above-named mine. On the lease S. Lang acknowledges the receipt of 100*l.* paid to him for the same in lieu of dead rent. Having bought all the parties interested out, it is mine absolutely, and has been for some time. Is not, then, Sir Charles Craufurd's statement that my rights had expired, "totally false and misleading?" and is it not a "very grave occasion," when I find parties trying to get possession of surreptitiously, and in an underhand way, a property which I have acquired fairly and honestly by buying and paying for it, and that I have been spending my time and money on for years? I know Mr. Lang and Mr. Brewis well enough not to be surprised at anything they may say or do, and I am afraid Capt. Cocking must be added to the category, but as I had always tried to do him good and help him on, and had done more, perhaps, than any man living to bring the Wheal Benny district before the public I had hoped better things of him. But to find one in the position of Sir Charles Craufurd identifying himself, as it would seem, with such transactions, is something, even in these degenerate days, that is really astonishing, and which, to say the least of it, is much to be regretted. My lease, on due notice, is open to the inspection of Sir C. W. Craufurd, or any bona fide shareholder in Wheal Benny.
Calstock, Feb. 19.

HENRY REYNOLDS.

PERRANZABULOE MINES—DUES ON PROFITS.

SIR,—The district of Perranzabuloe is at last attracting the attention of gentlemen interested in the development of the mineral wealth of the country. On Tuesday last Mr. Frederic Clift, LL.D. (London), Rev. W. H. Parkhouse (Perran), Mr. Dingey (Truro), and other gentlemen visited the mining settlement locally known as Wheal Vlow, worked last under the appellation of Perran Consols Tin Mine, with a view to consider the question of restarting operations. The boundary of Wheal Vlow sett north is that of Wheal Mary; south, Wheal Creeg; east, Halwyn; and west, St. George's Channel. The sett is half a mile in length on the run of the lodes, which are four parallel ones; two of them have been worked on, and from the small amount of work done the results are very favourable. Wheal Vlow is in the same rich belt of mineral ground in which are the St. Agnes lodes east of that district, and there is little doubt but that the lodes are a continuation of those of St. Agnes without warping them with the pen to make them so. The wealth of St. Agnes district is untold, and in the hands of Mr. Reynolds it will have justice done it. Wheal Vlow lodes are characteristic of those of St. Agnes in geological formation, and, like the majority of lodes in St. Agnes, have had, comparatively speaking, nothing done to them below adit. So that the lodes so far are unwrought, and only waiting to be tickled with a pick to bring forth their treasures.

The Duke of Buckingham is the lord, and the terms of the lease are something better than have yet been offered in the county. He sets a noble example in only asking dues on the profits. The water is light, and although it would be practicable to erect a pumping-engine sufficiently powerful to start with to cope with water which it is natural to expect in opening up lodes to any extent a 50-in. cylinder engine would be ample. This mine, as I have previously stated in the *Mining Journal*, was not abandoned through lack of mineral, but bad management. All the burrows have been dressed over for tin, and a good profit made in doing so. From reliable data in reference to the former workings, an inspection of the lodes above adit, and the prospects generally, a few thousand pounds judiciously laid out ought to place the mine in a position to make profits. In my opinion there are few better mining investments in the county.
Perranporth, Feb. 19.

W. NINNESS.

UNITED STATES CURRENCY.—The annual report of the Comptroller of the Currency to the First Session of the Forty-eighth Congress of the United States (Washington Government Printing Office) has just been issued in this country by Messrs. Trübner and Co., Ludgate-hill, and contains a vast amount of information of interest to all doing business with the United States. It appears that 262 banks have been organised during the year ended Nov. 1, 1883, with an aggregate authorised capital of \$28,664,360; circulating notes have been issued to these new associations amounting to \$7,909,190. This is the largest number of banks organised in any year since 1865. The Comptroller—the Hon. John Jay Knox—has certainly classified the details given in the volume in a manner which facilitates to the utmost the reference for facts connected with any given point, and has thus entitled himself to the congratulations of bankers and commercial men generally. The record of decisions by the Courts on

banking matters is of paramount importance, since by ensuring a stricter obedience to the law increased protection will be secured both to bankers and to those doing business with them.

REPORT FROM CORNWALL.

Feb. 21.—There is no longer any room for doubt that mining prospects have improved. So much is admitted on almost every hand. Beyond that, however, it is hardly possible to get, and it may be some little time yet before the improvement makes itself definitely and substantially felt. For one thing, the course of business is hardly likely to be interfered with more than it has been of late, or is at present; and this being so, while we have practically nothing to lose, there seems to be a great deal to gain. What we regard as a specially hopeful sign is the attention which is being paid to practical suggestions, and the manner in which self-help is being developed. The county, it is clear, must in the main depend upon itself; and only when that is fairly recognised can all its energies be fully developed.

Penhalls has very little to look for from its lords. The silence of the Duke of Buckingham has been broken by the intimation that he is willing to reduce the 1-24th dues to 1-48th, the same concession as that offered by Mrs. J. M. Williams and Mr. R. Davey. There is no reason why the adventurers should not state plainly what they all feel they mean—that this does in no way meet the requirements of the case. To agree to any such terms means the working of the mine at the risk of the adventurers for the benefit of the lords; and that is more than can reasonably be asked or expected of any body of men who have already been putting their hands somewhat heavily in their pockets for the benefit of other people. What is there to hinder the lords of Penhalls from following the example of entire remission during calls, set elsewhere?

It seemed almost too much to believe when it was rumoured that Dolcoath was to be made to pay rates on its 25,000*l.* fine. The assessment committee of the Redruth Union treated, however, this penalty as rent, and therefore assessable in the same manner as dues, and they have now rejected the appeal made by Mr. Marrack on behalf of the adventurers. The next step will probably be to bring the matter before the local bench of magistrates, and it is quite on the cards that the next again will be an appeal to the magistrates in Quarter Sessions. This will recall the old days of protracted litigation, when over and over again the question was argued "what constitutes a mine?" Surely it never can have been foreseen when this 25,000*l.* was levied that the adventurers were thereby rendered liable to this further mulct. Probably there never was a step taken in connection with mining more fraught with evil results in every direction. It seems as if we were never to hear the last of it.

We learn with regard to the changes in the mail trains referred to last week that Par escapes the threatened loss of its up mail passenger communication. Camborne, however, is left out in the cold in the manner already stated, and has Hayle to keep it company. In many respects the changes are admirable, and to most of the larger centres of population a very important gain. Probably it was inevitable in such a county that the smaller stations should suffer, but it is difficult to see why Hayle and Camborne are not better considered, and why for the sake of saving five minutes they should be deprived of some of their most important passenger connection with the Metropolis.

The expense of the mines have been increased by the continual rains, which have made the water-charges in some cases very heavy. Though it is some set off to this that the mildness of the winter has caused the dressing operations to be interfered with to an unusually small extent—indeed, hardly at all. Now, however, that we are close to March and the danger of frost is nearly over, it is much to be hoped that we shall have a turn of fine weather; though from the manner in which the country is charged with water it must be some little time before any benefit is felt.

There are signs of difficulties in connection with the discharge of men in reduction from several mines, and the throwing of others out of work by stoppages. A certain number can indeed be absorbed by an extension of tribute; but if only a moderate proportion of the threatened stoppages come to anything there will be a considerable quantity of unabsorbable surplus labour, for which it will be difficult to provide. Emigration is not the outlet it was a few years since; and in any case it is very unfortunate that the county should be denuded of skilled miners, who with average prosperity are urgently wanted at home.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 21.—The local Pig-iron Trade keeps steady, but without any push of work. Stocks at the furnaces are increasing in some cases, and they are the makers of part-mine and cinder qualities who are effecting most sales. All-mine pigs are flat. Foreign pigs are selling occasionally in parcels of from 200 to 500 tons, and agents do not in all cases consent to take the prices which consumers offer. Some principals are this week determinedly refusing to allow their agents to depart in the least from their open market quotations. Northampton pigs are 44*s.*, and Derbyshires 46*s.*, easy. Lincolnshire are 47*s.* 6d. upwards, delivered into this district. Hot-blast all-mine Staffordshire pigs are 65*s.*, and cinder pigs 40*s.* to 38*s.* 6d. Manufactured iron is dull, though here and there a few more enquiries are this week reported as to black and galvanised sheets. Doubles remain at 8*l.* to 8*l.* 5*s.*, and trebles at 9*l.* Best bars are 8*l.* 2*s.* 6d. to 7*l.* 10*s.*, and common 6*l.* as a minimum. Coal of all descriptions continue very abundant, and it is difficult to keep prices at anything like a paying level.

The Fair Oak Colliery Company have this week begun the operations towards proving the deeper coal measures of the Milford and Brockton portions of their mineral take. It is confidently believed that the venture will be successful, and, if so, it will make the company one of the largest concerns in the Midlands.

This, Thursday afternoon, the annual meeting of the Wages Board was held in Birmingham. The report was adopted. Mr. Benjamin Hingley, Chairman, said it would be a good thing if both sides did the best to sustain the board. Although trade was getting worse masters would be sorry to see a reduction in the present wages. Their own Masters' Association also held their annual meeting to-day, and Mr. Hingley was re-elected Chairman for three years.

The annual report of the Hamstead Colliery Company (Limited) states that the company is now in a position to supply the trade both by rail and canal, having, with a few unimportant exceptions, laid down the whole of their permanent plant. But additional ventilating power may be needed as the workings advance. Roads are now being driven to work the coal on the deepside. The total length of existing gate-roads in the pit, including cross-roads, is 5910 yards, as against 4230 yards reported last year. In addition to the gate-roads, there are 1793 yards of stall-heading. About 2000 tons of coal and slack are now being gotten and sold per week. This quantity can be rapidly increased, according to the exigency of the trade. The accounts show a profit of 602*l.*, made in the three months from Oct. 1 to Dec. 31—the period during which the company may be fairly said to have been trading.

Mr. W. Y. Craig, the member for North Staffordshire, who has given his miners at the Podmore Hall Collieries there notice to leave his employment, met them on Friday, when half their notice had run out, and told them what course he was about to take. Owing to the low price of coal, which is as cheap as in 1857, he must either lower wages all round or dismiss some of the hands, and close portions of the workings. He has resolved upon the latter course, but as this means loss to him he will have no shuffling by the men for whom work is found. If they take holiday on Monday and Tuesday they must take themselves away. He will have every man work full time. Nor will he have dirt sent up with the coal, a different practice will subject the offending collier to instant dismissal. Mr. Craig's miners have yet to reply if they are prepared to abide by these terms.

An obstinate refusal of their employers' offer on the part of the miners at the Lycett Colliery is leading to the breaking up of one of the largest branches of the relief society upon which they have hitherto been dependent for 6*s.* a week and medical advice in time of sickness. Rather than contract themselves out of the Employers'

Liability Act, which would issue in the relief being increased to 9*s.* a week, and the masters' contributions made 50 rather than 20 per cent., as at present, they have allowed their employers to withdraw their help, and are themselves declining to subscribe.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Feb. 21.—There has not been any noticeable change in the state of the coal and iron trades of Derbyshire for some weeks past, and the same may be said with respect to lead mining. The coal trade, indeed, is in a worse condition than it has been for more than a year past, for whilst the demand is much less than usual for the time of year, prices have gone down to an unremunerative point, which must result in wages coming down. A great many collieries are only working about four days a week, whilst what may be termed the ordinary dull season has yet to come on. The business doing with the Metropolis is very dull, even for February, and is not likely to improve for several months to come. The leading collieries are feeling this sharply, for some of them, such as Clay Cross, find a falling off at least of one-third of the trade with London as compared with December. Steam coal is also quiet, and would be still more so were it not for the contracts with the railway companies and the steady requirements for the blast-furnaces. Very little is sent away for exportation, owing to there being no shipping port within easy distance, excepting for the two or three collieries that are connected with the Manchester and Sheffield Railway, and by it are able to reach Grimsby and Hull. Coal for engine purposes moves off but quietly, less than usual being done with the Lancashire districts. The iron trade keeps up well considering the state of other and more important localities where the production is so much heavier. But the extensive foundries engaged in the heavy branch of business, including pipes and other large castings working very fairly, consume a good deal of the pig that is made. In fact, the foundries of the Staveley and some other companies are in a rather exceptional position, seeing that they raise their own ironstone and coal, and so can manufacture iron at a less cost than those who have to purchase it and then work it up. There is a fair business being done in malleable iron, both light and heavy, whilst the engine-works are fairly employed. Railway wagon builders are doing well both in making and repairing, and this branch of trade appears to be on the increase along the Erewash Valley.

The lighter branches of trade in Sheffield are still comparatively quiet, and the men are by no means so well off as they were at the close of last year. One or two of the old cutlery houses are carrying on tolerably well, but most others are doing but moderately. Orders from America have come in but slowly so far, and it is to be feared that the year will not be a good one, as was the case as regards 1883. Bessemer steel keeps up well all things considered, seeing the great falling off there has been in the quantity worked into rails; but the demand for billets for some descriptions of cutlery and tools has kept up well. In some descriptions of forgings also a good deal is absorbed. Crucible steel remains without much alteration, the make being still below the productive power. Still a fair quantity is taken for heavy castings, as well as for wheels and mining tools. In addition it may also be said that as the two armour-plate establishments are very busy a considerable quantity of steel is required for them, the surface plates of that manufacture being made at least 5 in. in thickness. In other descriptions of rolled iron, including ship and boiler plates, less is being done than was the case a month or two since, whilst there is not so much doing in hoop iron. The foundries in Sheffield and the district are by no means busy, and orders have come to them for spring specialties but slowly.

The Coal Trade of South Yorkshire remains without alteration, most of the collieries running short time. The low price at which the coal has to be sold is bringing the wages question up again, but this time by the masters. It is now felt that if collieries are to be worked without incurring a loss it will be necessary to reduce the rate of wages 10 per cent. This there is now no doubt will have to be submitted to, notwithstanding any resistance that may be made by the men or those who represent them.

TRADE OF THE TYNE AND WEAR.

Feb. 21.—The dulness which has pervaded so many of the staple trades of this district for some time has at length reached the Coal Trade. Many of the great steam coalworks north of the Tyne have been worked short time during the past week, and this will, it is feared, continue some time. The opening of the Baltic very early this year is, however, fully expected, and this will have a tendency of improving this and other branches of the coal trade. Contracts for the Baltic district both for steam and gas coal are now being entered into. The competition is very strong. A gas coal contract for 60,000 tons for St. Petersburg has been concluded at a price lower than last year. This is no doubt brought about by shippers who combine the ownership of vessels and the coal business. Only a few of the steam coalworks are expected to be fully employed this week; considerable stocks of gas coal will now be accumulated. The very mild winter has had a very serious effect on the house coal trade on the Wear. At the Lambton and Hetton Collieries, where the greatest amount of best house coal is produced in this district, many of the pits have lately been worked little more than half time. At these two great works there are about 20 pits, the majority of them producing best house coal, the others produce steam and manufacturing coal. The demand for bunker coal has fallen off considerably owing to the laying up of steamers, but as freights are now rising an improvement in this respect may be expected shortly. The demand for steam and manufacturing coal on the Wear is only moderate. There is no improvement in the demand for coke, and unless the exports of this article should prove very large the closing of new furnaces which will shortly occur will further reduce the consumption of coke.

A disastrous fire occurred at the Hebburn Colliery last week, the whole of the erections on the surface at one of the pits having been consumed. These were of wood, and as it occurred at the downcast-shaft and a large number of men and boys were underground at the time, fears were entertained that they would be suffocated by the smoke which descended the shaft. They were, however, all happily rescued from their perilous position. The damage done is estimated at about 1000*l.* In the old times the erections at pits were always of wood, but at all modern collieries are constructed mainly of iron.

The Iron Trade has been very quiet during the past week, and little business has been done. The low prices on the Scotch market has had a bad effect on the market here. There is increasing quietude and dulness in iron shipbuilding, and consequently in the industries depending thereon. The iron and plate mills are, therefore, worked irregularly. There is not much change in the price of any kind of finished iron. Bars are 5*l.* 2*s.* 6d.; angles, 4*l.* 17*s.*; ship-plates, 5*l.* 2*s.* 6d. Pig-metal is on the basis of 37*s.* for No. 3 with makers. The stock of Messrs. Connals' warrants show a decrease, having been reduced 1000 tons on the week. Shipments of pig-iron for the week were moderate, and the shipments of manufactured iron and steel were also on a moderate scale. The shipbuilders at Middlesbrough have agreed to accept a reduction of 10 per cent. on their wages, while those at Stockton threaten to come out on strike. There is no change of consequence in the coal and coke trades at Middlesbrough.

On the Tyne, above Bridge, industrial works continue to be extended. Iron shipbuilding will shortly be commenced by Armstrong, Mitchell, and Co., the necessary works being considerably advanced. Iron shipbuilding is carried on at Scotswood, on the north side of the river, and also at Danston, on the south side. The Redheugh Sheet Iron Company have greatly extended their premises. These works were the first commenced here for the manufacture of thin plates, and they have proved very successful. At Swallwell the manufacture of steel has commenced at the old ironworks—in the old times known as the famous works of Crowley and Mellington. At Wellington Mill, on the Derwent, Mr. Watson has opened the iron-works there also for the manufacture of crucible steel and other steel products. There is a large amount of water-power available here, derived from the River Derwent, and iron and steel was manufactured there at a very early date. The Blaydon Main Colliery,

situated near the mouth of the Derwent, lately passed into the hands of the Stella Coal Company, and the new firm are making great alterations and improvements in the works. A second drawing-shaft is now being fitted up, and the output of coals will shortly be largely increased. A good coking coal is raised here, and also gas coal and fire-clay, from which excellent fire-bricks and other fire-clay goods are manufactured. The Blaydon Ironworks Company have largely increased their premises, and they are now erecting an extensive new foundry. The new premises are very lofty and extensive, and they will form, it is believed, the largest foundry in the North. They will be engaged, to a great extent, in furnishing the necessary iron work for steam vessels. Below Bridge some very important works have been constructed during the past year, the marine engine works of the North Eastern Company being the most remarkable. Those works are very extensive and complete, and they comprise foundries, forges, and fitting-shops on a large scale. A steam hammer has been erected here, which is stated to be the largest machine of the kind on the Tyne.

At Middlesbrough on Tuesday there was no change in the state of the iron market; it appears, however, to be probable that the iron shipbuilders at Stockton and the Tees generally will shortly accept reductions in their wages. It is also pleasing to note that the ironworkers' strikes at Maryport, Workington, and other places in West Cumberland, are now at an end, after proving very disastrous both to the masters and men. At the West Cumberland Iron and Steel Company's Works a great portion of the men have resumed work at a reduction of 10 per cent., and more will shortly follow. Two of the furnaces at the Workington Ironworks have been put in blast, the men accepting a reduction of 10 per cent. The Maryport Hematite Iron Company have also put several of their furnaces in blast, and the same course will be taken at the other works in the district. The closing of this strike will have a good effect on the Durham coke trade.

TRADE IN SOUTH WALES.

Feb. 21.—There is no realisation of activity in the Steam Coal Trade. The amount sent away last week from Cardiff was 133,092 tons foreign and 19,653 coastwise; Newport, 36,857 tons foreign and 18,299 coastwise; Swansea, 13,113 tons foreign and about 18,000 coastwise. House coal is quiet, and small steam coal is not quite so healthy. There was a marked falling off in the tonnage of coal carried by the Great Western in January, and consequently from the collieries in South Wales. Still, some of the collieries last month did much better than for a long time past. Fforchaman, for instance sent 5000 tons over the Great Western; Aberaman, 4000 tons; Blaidd, 3900 tons; and Mountain Ash a like quantity. At the same time there was a falling off as regards Aberdare, Bwllfa, Cwmdare, Merthyr, Crawshaw, &c. The London and North-Western, however, took a full average for several of the collieries in South Wales, including 5000 tons from the Aberdare Iron Company, 1600 tons from Ebbw Vale, 1200 tons from Fforchaman, and 1500 tons from Middle Duffryn. The Great Northern also took 2400 tons from Aberdare, whilst the Midland took 1400 tons from the same place. The output both relating to coal and iron ore in the Forest of Dean for the year 1883 shows a falling off as against the previous 12 months, the same being traceable for the six weeks' strike during the early months of the year. The output of coal was 718,002 tons, against 781,789 for 1882, a reduction of 63,787 tons. In regard to iron ore, the production was 64,441 tons, against 68,075 tons for the previous year.

The Steel and Iron Trades of the district are very quiet, but orders are still sufficient to keep the works going. A parcel of 2270 tons was sent away from Cardiff last week, and a small quantity of fish-plates from Newport. Iron ore has been received at Cardiff to the extent of 7610 tons from Bilbao, and 2820 from other places; Newport received 9740 tons from Bilbao, and 5610 from other places. Prices remain low.

At Tredegar operations are being actively pushed forward to place No. 4 blast furnace, which has been idle for some time, in blast again, which is an encouraging sign. The other furnaces are working with their accustomed regularity. In the guide mills matters are in the most satisfactory condition, with abundant orders in hand for fish-plates and tie-bars. The steel finishing department, however, is not so bright. It is true that the mill has been at work since Monday upon some very awkward steel rail orders, but the outlook is rather gloomy one; there does not appear to be many orders in hand. The Bessemer department has also been in operation once—on Monday.

The Tin-plate Trade still maintains a downward tendency in prices, only 14s. 6d. per box being offered for good 1000s, while charcoal made are quoted at from 18s. to 20s. Steel-plates with a coke finish sell readily, and this appears to be the plate of the future. The January shipments of plates to all parts were 17,000 boxes more than the previous January. The figures are 427,000 January, 1883, as against 445,000 boxes January, 1884. Of these the States took 332,000 boxes, leaving 113,000 to all other parts. There is a falling off of 12,000 in the shipments to the States, but this was more than made up by what was sent to other countries, as evidenced by the total increase.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Feb. 21.—At some of the Cardiganshire lead mines the raising of lead has been stopped, owing to the lowness of price, and the operations are confined to laying open reserves of ore, and the raising and selling of zinc ore as far as this is practicable without raising lead ore as well. In the earlier part of the present century there was a similar depression in mining when there were scarcely a score of mines at work in the county. Latterly there have been about 70; but, of course, the number is at present greatly reduced. Efforts have recently been made by the gentlemen who are opening up copper mines in the Snowdon region to get the North Wales Narrow-Gauge Railway extended from Rhyddu to Beddgelert. So far they have not been successful, but with the opening up of the quarries at Bwlchddellor and Caegors, and the development of the copper mines in question this extension cannot long be delayed.

It is not without feelings of regret that one sees the announcement of the sale of plant at the Clogau Copper Mine. This mine was one of the earliest and most successful gold mines in North Wales, and to its original owners proved a very opportune mine of wealth. Of late years it has had all the advantages of intelligent and experienced management, and with its close comes, I fear, the death blow to gold mining in North Wales; unless our old friend Mr. Readwin proves able to extract the precious metal profitably from the cupreous pyrites of the region between Dolgelly and Trawsfynydd.

Referring to my notice a fortnight ago of the adoption of the electric light at the Llanwddyn Stone Quarries, Mr. J. McInnes, of Brynmynach, near Barmouth, is having his house lighted up by the same method. What an admirable field for cheap electric lighting, for its quarries, villages, and private houses, is North Wales. Especially when it is remembered that there is scarcely a farm-house of any considerable size without its water-wheel.

The hearing of the case of the promoters of the Anglesea Central and Carnarvon Railway before the examiner on standing orders has been postponed until Feb. 26. The Denbighshire and Shropshire Railway bill has now finally passed standing orders, the requisite sanction of the shareholders of the Wrexham, Mold, and Connah's Quay Railway having been obtained. This railway will cross a considerable part of the town of Wrexham by means of a viaduct, and the Town Council, while not desirous of offering any opposition, intimate that no obstruction or restriction must be made in the width of the streets crossed by it. The late stormy weather has affected the salt trade, and this combined with a sluggish demand has caused an accumulation of stocks. Prices are so low that many furnaces have been laid off. The total export of salt from Cheshire in January was rather over 60,000 tons, 18,000 tons going to the United States.

Evan Lloyd, a collier working at Plas Power Colliery, was fined 9s. at Wrexham last week for placing his lamp so near to him that he might be able to strike it with his pick. Considerable excite-

ment is created by the case of Hall, Her Majesty's Inspector of Collieries, against the Bersham Colliery Company, and the Court is crowded by colliers, colliery proprietors, and engineers at each hearing. The case is again adjourned. A local strike is going on at Maes-y-Craig, one of the Buckley collieries. The colliers generally are now turning their attention to providing a fund for the support of old and disabled colliers.

From the returns published by the Liverpool Corporation it appears that the following sums have been expended upon their Vyrnwy Waterworks in North Wales since the commencement:—Llanwddyn Works, 166,676l. 15s. 7d.; quarry, 52,968l. 16s. 9d.; aqueduct, or proposed line to Liverpool, 389,470l. 4s. 6d.; land and easement, 203,786l. 9s. 2d.; making a total of 812,896l. 6s. As the bulk of this money is spent in Wales it makes up to a considerable extent for the depression in other industries.

REPORT FROM LANCASHIRE.

Feb. 21.—There is no indication of any improvement in the condition of the coal trade in this district. The demand for the better classes of round coal fluctuates a little as stocks have to be replenished, and here and there is reported to be rather better, but actual requirements continue very small, and the winter season is passing away leaving behind it heavy stocks in the hands of colliery proprietors, with which they will have to face the summer. In the lower qualities of round coal for general trade purposes business continues slow; the demand keeps upon about the same level, but the prospects for the future are not such as to encourage expectations of any increased consumption. Notwithstanding that pits in most cases are not working more than about four days a week, the output is in excess of present requirements, and prices are being forced down by stocks being pushed for sale at specially low rates, both Lancashire and Yorkshire coal being offered in this market in many cases at prices which are already quite as low as the ordinary summer rates. Best Wigan Arley is not fetching more than 9s. 6d. to 10s.; good second qualities average about 8s. Pemberton four-feet, 7s. 6d. to 7s. 9d., with Crumbrink coal to be got as low as 7s., and common round coals at 6s. to 6s. 6d. per ton. Engine fuel moves off pretty steadily, and the small quantity of round coal now being screened is causing a scarcity of slack in the market, with a hardening tendency in prices. Burgoyne at the pit mouth averages 4s. 6d. to 5s.; best slack, 3s. 9d. to 4s. 3d.; and ordinary qualities 3s. to 3s. 6d. per ton.

There have been rather more enquiries for shipment during the past week, but with a continued scarcity of vessels the actual business doing has been small, and good Lancashire steam coal is still offered at about 17s. 6d. per ton, delivered at the High Level, Liver pool, or the Garston Docks.

Business in the iron trade of this district continues without animation, and with no immediate prospect of any improvement. So far, however, as pig-iron makers are concerned, they are kept busy with the orders they have on their books, and do not press sales; but there is very little new business coming forward, and although prices are low there is no inducement in the present state of the market for speculative transactions. What little business there has been doing during the past week has been on the basis of 44s. 6d. to 45s., less 2½ per cent. for Lancashire and district branch of forge and foundry pig-iron delivered equal to Manchester, and at these prices makers are firm. In hematite a slight improvement is reported, and in some cases rather better prices have been obtained, but good foundry brands delivered equal to Manchester are still to be bought at 56s. 6d. less 2½ per cent. Finished iron makers are not so well off for orders as the blast furnace proprietors, and it is only in a few exceptional cases that they have work in hand which will carry them over the next month or six weeks. The new orders giving out are very small, with a tendency towards weakness in prices, which for delivery into this district average about 6l. 12s. 6d. to 5l. 15s. for common plates, 6l. for bars, 6l. 5s. to 6l. 7s. 6d. for hoops, and 7l. 10s. to 7l. 12s. for sheets.

The condition of the engineering trade remains without material change. Employment generally continues fairly steady, and the returns for the past month issued by the trades union societies do not show any material increase in the number of members receiving out-of-work support. In the Manchester and Salford district the leading firms are mostly fairly well supplied with work, and although the recent strike in the cotton trade injuriously affects some districts, a more hopeful tone is expressed in some quarters owing to rumours of considerable orders having been secured lately.

REPAIRING SHIPS IN A SINGLE TIDE.

In the matter of repairing trifling defects which are accidents inseparable from the seafaring occupation it is a universal maxim both with shipowners and captains that if time can be economised the saving of money follows as a consequence, and this has been more than once demonstrated to be the case by the adoption of the system of docking carried out under the patents of Messrs. CLARK and STANDFIELD, and it need scarcely be said that those who are in a position to offer these advantages of economy in time and in cost seldom fail to realise handsome profits for themselves; hence there is full justification for recommending the Dumfries Dry Dock, Shipbuilding, and Engineering Company, whose prospectus will be found in another column of to-day's *Mining Journal*, and which has been incorporated with a capital of 100,000l., in shares of 20l. each, for the purpose of acquiring the very valuable site from the Marquis of Bute, which is held for the term of 99 years, and the constructing thereon of Messrs. Clark and Standfield's Patent Floating Docks for docking ships, as also for the purpose of erecting thereon such engineering and other works, and also for the purpose of acquiring and taking over the successful and profitable business of the Dumfries Ship Repairing and Engineering Company (Limited), now carried on by them at the Bute Docks, Cardiff, and the plant, machinery, stock-in-trade, and the effects of the said company. The accommodation existing at Cardiff for the repairs and docking of ships is insufficient for the requirements of the port, and with its rapidly-increasing trade the want of additional accommodation is being more keenly felt every day. The reason of this will be best understood by considering the development of the port as shown by the statistics; the shipments of coal alone increased from 3,181,843 tons in 1870 to 6,740,755 tons in 1882.

The directors could scarcely have been more judiciously selected or of greater influence, since the board includes Alderman Cory, J.P., of Cory Brothers and Co., the well-known colliery proprietors and shipowners, and the no less known steamship owners, Messrs. Henry Cloake, of Cloake and Son; Harry F. Cohen, of Jos. F. Cohen and Co.; James H. Cory, of John Cory and Sons, all of Cardiff; with Mr. T. H. Owen, engineer of Bute Docks; and Mr. John Sanderson, of Taylor and Sanderson, steamship owners, of Sunderland; so that more than usual importance attaches to the statement that the directors and their friends, being largely interested in the shipping trade, have taken a considerable stake in the company, one of the qualifications for the directorate being the holding of 1000l. stock or shares in the company, and the directors, by reason of their position, will be able to influence a large amount of work to the new company. Provisional arrangements with the directors of the Dumfries Ship Repairing and Engineering Company (Limited), have already been made, subject to the approval of their shareholders, for taking over that concern, with their machinery, goodwill, &c. This company has paid 15 per cent. per annum since its formation, and the agreement provides for the purchase being paid for by shares in the new company.

It is claimed for the new dry docks that they are far superior to any patent slips; they dock and lower vessels on an even keel, and subject them to no strain or risk. Patent slips are especially suited for small vessels only, whereas these docks will equally accommodate both small and large vessels. By way of description of the new floating dry docks themselves the prospectus states that they will be constructed by Messrs. Clark and Standfield, the well-known engineers and floating dock builders, who built two of their floating docks for the Russian Government, and another for the port of Barrow-in-

Furness, where it can be seen in daily operation. The new docks will contain many improvements, with special modifications to meet all the requirements of the port of Cardiff; they will be able to accommodate the largest vessels entering the port, and will be very rapid in their action. Each of the two docks will be able to lift, sight, and lower one vessel, and lift a second one within three hours—that is, well within one tide. The dock will be respectively 270 ft. and 230 ft. in length. They are readily capable of being united into a single dock 500 ft. in length. There are provisions by which the dock can at any time be extended in length. The end view of the docks show them to be of the shape of the letter L, the upright side being attached by 12 parallel booms to 11 vertical girders, built into the sea wall, and also securely attached to a mass of concrete by horizontal and diagonal girders. These booms keep the docks always horizontal, and allow such a large range of vertical movement that they can float on the highest flood tide.

With regard to docking, the operation is very simple. The dock being ready resting on the gridiron the vessel is brought over the keel blocks, and is quickly centred by the improved mechanical side shores, which pass through the side of the dock; the pontoon, or bottom of the dock, is pumped out till the keel blocks bear against the keel of the vessel; the bilge carriages are then rapidly brought into position, giving the vessel substantial support in the most effective manner; pumping is then proceeded with till the vessel is brought well above the water. This operation will not usually occupy an hour, and the reverse process of lowering a vessel into the water will occupy less than half an hour. The mechanical side shores and bilge carriages are readily worked from the top deck of the dock; they enable a vessel to be more rapidly centred and shored than can be done in any graving dock, and give much greater support than the ordinary blocking. There are seven main gangways communicating with the pontoon deck through apertures or passages in the side of the docks—four to the 270 ft. length and three to the 230 ft. length of the docks. Some of the upper booms also form gangways, affording independent access to the top decks. All these gangways are available at all times. On the top deck of the docks there is a large crane on rails; this can travel the whole length of the docks, so as to deliver materials wherever required, and can be used for removing and replacing heavy pieces of machinery.

The convenience with which any desired repairs, &c., can be effected is obvious. The vessel when docked, being high and dry above the water, is in the best possible position for being cleaned and painted with ease and rapidity; sunlight and air have free access to every part, so that the surface of the iron and the paint dry very rapidly. The men work always on a dry platform, and are free from the unhealthy dampness necessarily present in a graving dock. Every part of each dock is thoroughly accessible for cleaning and painting at low water. The docks will rest on the gridiron, when the bottom can be readily got at whenever considered necessary for more extensive overhauling. One part of the dock can be easily docked on the other, in the same manner as with the Barrow Floating Dry Dock, thus affording exceptional facilities for self-docking, cleaning, and preservation. The building and repairing establishment in connection with the Dry Docks will be furnished with the most improved machinery and tools to meet all modern requirement, and rails will be laid through the yard, putting it in direct communication with the Great Western, London and North-Western, and other neighbouring railways, thus saving the transhipment of materials. The contract time allowed for docking a vessel on the Barrow Floating Dry Dock was three hours, but 35 minutes have usually been found sufficient for the actual operation, and the proposed docks for Cardiff will be correspondingly rapid. Every shipowner will at once realise the great advantage the proposed docks offer over all other graving docks in being able to raise, sight, and again float a vessel so that she can be taken into the loading dock all in one tide. This saving of time is one of the most important advantages for shipowners.

That the enterprise has a good field for profitable business cannot be questioned, and with Sir E. J. Reed, K.C.B., M.P., as consulting engineer, and Mr. R. W. B. Ivens, of Annear and Ivens, the well-known ship and insurance brokers as secretary, there need be no fear that the working portion of the management will be efficiently conducted. The prospectus states that the situation of the docks is alongside the fairway of the Channel, within a distance of 150 yards of the entrances to the Bute Docks, and is by far the most commanding and convenient position of any dock in the port, having a depth of water for vessels of the largest draught and tonnage, and ensuring the following amongst other advantages:—The docks not being inside either of the existing docks, vessels coming to Cardiff Roads, and having to load at Penarth (or any other docks that may hereafter be constructed) will find these docks most conveniently situated, enabling them to have their repairs done without the detention of entering the Bute Docks. Vessels can be lifted, sighted, and put back again into the water so as to catch the same tide in dock, thus saving time and expense. No other dock can perform such rapid work. The new dry docks will be so well placed that, apart from their perfect appliances which enable them to surpass any other dock in Great Britain in rapidity of docking and undocking ships, light vessels will be able to come up the drain, be docked high and dry out of the water before the loaded vessels will be ready to proceed out of the dock, thus saving in most cases 10 or 12 hours. More than this is unnecessary.

FOREIGN MINING AND METALLURGY.

The Belgian Iron Trade remains without any important change. Quotations have not shown any tendency to a recovery at present. English pig has remained at 2l. 2s. 6d. per ton, while the Belgian Luxembourg quotes its casting-pig at the same rate. The production of the Belgian Luxembourg has, however, been disposed of with difficulty, and it is the same with Charleroi casting-pig, which has, however, maintained a quotation, in some instances, of 2l. 16s. per ton. As regards refining pig, mixed has not been carried above 1l. 14s. per ton; this would make the price for ordinary pig 1l. 18s. per ton, and that for hard pig 2l. 2s. per ton, if, however, concessions were not the order of the day. In the Luxembourg, refining pig has remained at about 1l. 15s. 2d. per ton. No. 1 iron has continued to be forced at 4l. 16s. per ton upon the Belgian markets; No. 2 has maintained the usual difference of 6s. per number, while No. 3 has been rather weak at 5l. 8s. per ton. Plates have scarcely varied. No. 2 has remained at 6l. 8s. per ton, while No. 3 has been scarcely so firm, at 7l. 4s. per ton, and No. 4 at 10l. 8s. per ton. Plates of commerce have remained at 8l. 16s. per ton. The production of pig in Belgium last year is officially returned at 770,669 tons, as compared with 717,000 tons in 1882; 624,000 tons in 1881, 608,000 tons in 1880, and 453,000 in 1879. The production of iron in Belgium last year was 478,028 tons, as compared with 500,000 tons in 1882; 479,000 tons in 1881, 493,000 tons in 1880, and 410,000 tons in 1879. Steel was made last year in Belgium to the extent of 331,428 tons, as compared with 305,000 tons in 1882; 261,000 tons in 1881, 120,000 tons in 1880, and 110,000 tons in 1879.

The French Iron Trade has continued dull, but prices have not experienced any further reduction. At Paris iron has made an average of 5l. 12s. per ton, while in the Nord the current price has been 6l. 4s. per ton. It is hoped—although not very confidently—that the spring will bring with it some revival in building industry. Plates have made 8l. 8s. per ton at Paris, but have not been very firm at this price. The Orleans Railway Company has ordered 28 locomotives from the Fives-Lilles and Batignolles workshops; the Cail Company has also received an order for 20 engines. The Firming Steelworks Company will supply the steel axles and tyres required. Business has shown some weakness upon the German iron markets. Pig especially has been in little demand, while rolled iron has only maintained its nominal price with the help of a convention on the part of producers. Plates have been a little sought after, but have not been in at all active demand. A few orders have been obtained of late by the German steelworks; at Carlsruhe, for instance, the Union of Dortmund has secured a contract for steel rails at 7l. 17s. 2d. per ton. A rather important adjudication at Cologne has been divided among several works. Messrs. Stumm, of Neukirchen, has taken 970 tons of rails at 6l. 8s. per ton; the Hoerde

not run away. We have a nice little nest egg in the reserve fund, which brings us in a little interest, and we have a lot of ore.

Mr. BOWMAN: Is it, per ton its value where it lies?—The CHAIRMAN: Yes, where it lies. Carried down to the station it would be a little more. We regard it to be worth that price where it is. We are erring on the safe side.

Mr. BOWMAN: If that were brought into the accounts they would show a profit. The CHAIRMAN: It would not only diminish the balance to the debit of profit and loss account, but in less than 12 months we should be on the right side with a small balance over.

Mr. KITTO: In answer to the questions put by the hon. proprietor it is almost impossible to tell what quantity of ore we have in reserve. We have many points of operation. Many of them are not in new ground but in ground that was opened years ago by the late company, and this ore has been lying standing by the side of the place that they work upon. If we knew it was in whole ground in each of the places that we are operating upon from bottom to top we could then estimate pretty accurately the quantity of ore that that ground would contain, but I have not the slightest hesitation in saying that we have more available ore in sight underground now than we had 12 months ago. (Hear, hear.) I should say that we have at least 20,000 tons of ore opened and available for stopping. I think, as the Chairman remarked just now, that there are very few mines in the United Kingdom that can boast of such reserves as we can in Frongoch. With regard to the stock of ore on hand I may say that that also it is almost impossible to reckon to 10 tons what we have dressed and partly dressed, but I am sure we have more than we estimate. Of that I have not the slightest doubt. If we err at all we try to do so on the safe side. I do not know that I can add anything to what the Chairman has said on the subject of the mine. It has improved during the past year, and, as I stated just now, we look better than we did 12 months ago.

Mr. KITTO then explained the nature of the workings by means of a map. The Chairman was unanimously re-elected a director. The auditor was also re-elected, and the proceedings closed with a cordial vote of thanks to Mr. Ross for presiding.

GROGWINION LEAD MINING COMPANY.

The annual general meeting of shareholders was held at the Guildhall Tavern, on Thursday, Mr. Ross, F.G.S., in the chair.

Mr. GEORGE BEDFORD (the secretary) read the notice calling the meeting, and the report of the directors was taken as read.

The CHAIRMAN: Gentlemen, I suppose it is expected of me on the present occasion to make some few remarks on the subject of the accounts and of the directors' report. I am supposed, in the language of a witness on the other side of the Atlantic, "to speak a piece," but I can assure you I feel much more inclined to pronounce a funeral oration over the remains of an old friend that I have known for many years; but I will endeavour as far as I can to introduce one or two remarks which shall show, perhaps, more clearly the condition of the lead trade for many years past than that of a perpetually falling market. The richest mines have been able to stand that fall with no worse effect than a diminution of dividends until quite recently, but now it has pressed so severely upon all mines producing this metal that I think I may venture to say to the shareholders of this company there are not more than half-a-dozen mines throughout the length and breadth of the kingdom that are at work at the present time hoping even to cover their cost. That being the case, you will not be surprised to hear that we have ceased working, finding that it cost us very nearly 35s. to get a sovereign's worth of ore. We have gone on as long as possible working the richer parts, and leaving the poorer parts for better times; in fact, we have kept our mine open as well as we can, and done our utmost to protect the property, and in doing so we have expended all our available means, and now the time has come when it is absolutely impossible to carry on any further with lead at its present price, much less with the hope of making a profit. We put that before you in the second paragraph of our report. The next paragraph places a suggestion before you which has been brought under our notice by the managers, to the effect that an amalgamation is desirable of the various properties named in their report. Should you think, after a complete ventilation of the project, that it is worth our while to do so, I must tell you that the object for the present would be, provided the scheme is finally approved, that it should be carried out until something like better times are before us. I do not know whether the gentlemen present happen to be shareholders in another company that I was addressing only a few days ago (Frongoch), where I gave certain data with reference to the present condition of the lead trade. If they were they will have heard there the reasons I have for thinking that, as the present outlook may be, there may possibly be something like a bright future before us. I have preached from that same text for three or four years, and I shall continue to do so until I am utterly convinced that there is no possibility of any revival in the lead trade. Should Grogwinion ultimately collapse we may feel satisfied that it is due to the excessive importations of metal sent us by the foreigner, but for those large importations the lead trade would at the present time be as flourishing as several other branches of English trade which need not be specified, and we should be making, as this mine has made in days that are past, very good profits indeed. Mr. KITTO's report is worthy of very careful consideration indeed, and I shall ask him presently to make a few observations with regard to his third paragraph, because I think he is far better suited to do so than I am. We shall then be able to take the discussion, and arrive at some proper conclusion. The statement of accounts put before you discloses no new feature, but should any shareholder wish to ask any question we are prepared to answer him. I have now to move "that the reports of the directors and managers be received and adopted."—Mr. BOWMAN (director) seconded the motion.

Mr. KITTO (manager) said that in his report he had given his reasons for the suggestions made. He would lay a plan on the table which would show the whole thing. It was a longitudinal and transverse section made from actual survey.

A lengthy discussion then took place, embracing all points connected with the company. In this Mr. WATSON, Mr. PAGE, Mr. W. D. HAYLE, and other shareholders took part. The scheme of amalgamation was generally approved, and the policy of the board to hold the properties and await the advent of better times was endorsed. It was stated by the manager and others that mines with lead at 6s. 10s. a ton could not pay, and that to continue to place ore upon such a market was merely causing money to be thrown away. Mr. KITTO said that lead had not been so low for the last 51 years.—The report was unanimously adopted.

The CHAIRMAN said that if this company were wound-up there were plenty of people who would gladly buy the old Grogwinion to hold it in hand and restart it when times revived. The board proposed to save it themselves by holding it for the benefit of the shareholders. Grogwinion had been a profitable mine, and would be so again. The greater part of the expenses had ceased, and the board were taking no more. The shareholders would be called together again to consider the question of amalgamation, and that would imply the raising of a small amount of capital by way of preference, and a considerable reduction in their present holdings.

Mr. BOWMAN proposed the re-election of the retiring directors.—Mr. KITTO seconded the motion, which was carried unanimously.

Mr. KITTO pointed out the advantages of the amalgamation, and there was every prospect that with improved times it would result in success. A special meeting would be called to carry out the resolutions.

The proceedings closed with a vote of thanks to the Chairman for presiding.

KIMBERLEY CENTRAL DIAMOND MINING COMPANY.

A meeting of shareholders in this company was held at the offices of the agents of the company in England, Messrs. Freeman and Blomfield, Holborn Viaduct, on Friday, Feb. 15.

Mr. F. BARING-GOULD in the chair.

The CHAIRMAN said the meeting had been held to discuss the report and balance-sheet, and to enable the committee, who had been appointed to watch over the interests of shareholders in England, to answer as far as possible any questions. He wished to say a few words on some matters materially affecting the position of the company and of interest to shareholders here. The committee were requested by the directors to get reports on the underground working of the mine; they have reported briefly as to its feasibility, but awaited further data to report fully as to expense, &c. The new mining ordinance was a direct gain to the company, as any company following it up the great principle was established that value of property in mines carried proportionate voting power and representation on mining boards; while protecting the minority by placing the assessment of the mine in the hands of impartial men, with the right of appeal to courts of justice if desired, and other safeguards. There was also the affirmation of the fact that mining boards come under the scope of the Public Bodies Debts Act, with certain modifications, this was a guarantee to investors in the mine. The amalgamation with the Rose-Innes Company and the South-East Company, latter was in course of completion, and would secure a permanent majority on the mining board to the Central Company. While only such claims as were found, by prospecting, at 100 ft. below the level of the hard rock were considered as the basis for amalgamation, the whole number of claims thus belonging to the Central was more than twice the number of the next largest company in the Kimberley Mine—the French Company, at the same level. Shareholders must remember that the committee were, with the consent of the directors, engaged in negotiations with the French directors to amalgamate the two companies; and who knew the mine could realise the immense advantage which would be gained by the shareholders in both companies had such an amalgamation been carried through. The only point which seemed difficult to the French directors was to agree to the demand of this company that the future company should be an English one, although the majority expressed themselves favourable to it. The company certainly expected from an answer of some sort to a letter which was addressed to them on this question, or that it would at least have been brought before their last annual meeting of shareholders in Paris; but on both these points they were disappointed. Failing this the committee urged on the directors the necessity of registering the Central as an English company, as financially likely to strengthen the position of the company, and to forward other amalgamations. This seemed most likely to lead to the control of the production of diamonds which would thus place the Kimberley Mine in the position it should occupy—that of being the richest mine in the world. The directors of Kimberley, in reply, doubted whether a directors at a distance was in course of completion, and they considered a local board would meet this point, as there were so many men eligible as directors on this side who were thoroughly conversant with the mine, and whose interests would not clash with the interests of the shareholders. (Applause.)

Mr. FATHURER asked what had been the hitch with the Rose-Innes proprietors?—The CHAIRMAN replied that the hitch had arisen on the question of payment. Legal opinions had been taken on both sides, and the position of this company was considered to be very assuring.

Mr. J. FENLASON, as representing a shareholder, after referring to the lucid and interesting statement made by the Chairman, said the company would undoubtedly be benefited by the passing of the new mining ordinance, for hitherto the company had been most unfairly treated by the Mining Board. He expressed his faith in the future of the company, and mentioned that in the past year, in

spite of all the difficulties which had been contended with, nearly three millions' worth of diamonds had been sent over from the Kimberley Mine, while in the previous year the amount was nearly four millions. During the last 13 years the mine had produced over 10 millions' worth of diamonds.

Mr. ADLES trusted that in any amalgamation with the French Company it should be a *sine qua non* that the board be a London one, and that its chief office should be here. (Hear, hear.) He was unfortunately, a shareholder in the French Company, and he could say that when that company was making hundreds of thousands of pounds in profits, the shareholders only received a paltry dividend of 5 per cent.

The CHAIRMAN said that in any amalgamation that the company should be an English one, and, indeed, it was the wish of every French shareholder he had met that that should be the case in any amalgamation which they might take part in. (Hear, hear.)

Mr. ATKINS referred to the negotiations which had been going on with the French Company, and said that though it was desirable that such an amalgamation should take place it certainly was not an absolute necessity. The Central people wanted an amalgamation to be on the terms of claim for claim; but in the case of the French they wanted to be on the basis of 45s. He did not mean to say that this cutting out of the French claims would be continued, for he believed that lower down the mine would become vertical again; but at present their position was certainly not so good as to justify an amalgamation on the principle of claim for claim. He (Mr. Atkins), in reply to a question, said he was at the mine six months ago, and at that time they had sunk 250 feet below the present workings, and at that depth the sides were nearly vertical. They had three or four years' work before them. The present depth of the mine was between 350 and 400 feet.

On the motion of the CHAIRMAN, seconded by Mr. HENRY JOSEPH, a vote of thanks was passed to the directors and managers of the company for the way in which they had conducted its affairs, especially during the past half-year. The meeting then closed with a vote of thanks to the Chairman.

FRONTINO AND BOLIVIA (SOUTH AMERICAN) GOLD MINING COMPANY.

The annual meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Tuesday, Mr. R. DONAGAN in the chair.

Mr. J. JAMESON TRURAN (the secretary) read the notice convening the meeting, and the report was taken as read.

The CHAIRMAN, in moving that the directors' report and the statement of accounts up to June 30 be received and adopted, said he had a few remarks to make. In the first place he wished to give expression to his regret that the profit shown on the accounts was so small as 2500*l*. This was not caused by any very material falling off in their resources in regard to the gold, for in the corresponding half-year the amount yielded was 34,758*l*, and this half it was 32,926*l*, showing a decrease in the yield of gold of only 1832*l*, while the profit on exchange happened to be 6342*l*, against 4797*l*, being an increase of 1545*l*, bringing the total returns to about the same sum as in fact is mentioned in the report. The cause of the decrease in profit was the increase in expenditure over the corresponding half-year, but then it must be recollected that during the 1883 half the expenditure of capital account was 8024*l*, while during the 1882 half it was only 1322*l*. Of course during 1882 half year the works paid for out of capital were much greater in extent than in the 1883 half, when the money received on account of the new capital had come nearly to an end, while the works of development had not. A good many items of outlay which in the 1882 half were charged to new capital were in the 1883 half charged to revenue, not because they were not fairly charged to capital, but because of clear works of development, the advantage of which is to be reaped in the future, but for the simple reason that there was no other means available out of which to pay for them. The new capital, which stood at 35,686*l*, on Dec. 31, 1882, stood at 36,610*l*, on June 30, being an increase of 924*l*; only 1322*l* was charged to capital, and the means by which 1322*l* was paid out of 924*l* was simply by having a reduced balance at the bankers at the end of the half-year. If, however, it had not been so, the balance would have been so large. He regretted that the same thing had been going on during the five months since the date of the last made up accounts to some extent. Let them look to the expenditure on capital account during that period. The monthly account would have shown that it was as follows:—July, 101*l*; August, 97*l*; Sept., 98*l*; Oct., 89*l*; Nov., 107*l*; total, 492*l*; while during the whole of that time the permanent works in several mines had been going on to completion at the cost of revenue, with the exception of a trifling sum in the case of the Salada mine, where the profit had fallen off, but it did not in the least touch the point of why the brilliant expectations which were shadowed forth some years ago had not been realised. This was an instance of jumping too readily to a conclusion, and of assuming that surface mines could at the word of command be converted into shaft and level mines directly it was found that the veins descended steadily; and that, as such veins gave indications of being richer below than they were on the surface, the rich ore was to be got from lower, as an enchantment's wand. In order to do this the first thing wanted besides the lode was money and patience. The first had been provided and had been spent, the other was now being expended. A little more of it was, however, required. He would explain why he hoped it might be only a little more. Salada was to have been 1000 tons a month at 1 1/4 oz. yield at the old measurement, which would be equal by the new measurement to between 1300 and 1400 tons at upwards of 3/4 oz. The highest return of gold in the half-year was in February, when 630 oz. of gold were obtained, the lowest return being in May, when only 392 were obtained. The highest number of tons stamped was in June, when 942 tons were stamped. The highest yield per ton was in March, when 641 tons produced 507 oz., or 92-100ths of an ounce per ton. The lowest yield per ton was in June, when 942 tons produced 453 oz., or 48-100ths of an ounce per ton. There were two lodes, the main and the flat lode, the latter being the richer. The level in the flat lode instead of being stopped as it proceeds was only being driven, the intending stops backwards afterwards, and the produce was, therefore, stopped, the main lode meanwhile only yielding. This would account for the falling off in the returns during the past six months. The mine with only one level open had turned out 942 tons, therefore it could turn out the anticipated 1300 when both were going again. It had turned out ore averaging from 67-100ths to 79-100ths before the rich level stopped, therefore it could yield the 3/4 oz. It had stamped 942 tons with only 36 heads of stamps, or 12 heads short, therefore it could stamp 1250 tons when the further 12 heads were put up, and they should be put up as soon as all the levels were going. The extra cost for the year from November, 1882, to October, 1883, was 410,799*l*, or 2 1/20*l*. Another instance was to be found in the Salento Mine, which had been undergoing a thorough system of organisation. The levels at 143 or 150 ft. had good mineral in the end, and in the same level going south the lode showed signs of widening out again. The works in Salento had been materially delayed through the change of the system of off-draining, from the employment of a steam-engine to the use of a water-wheel, the wheel to be propelled by the Pocom water, after it had done its work in the stamps on the higher ground. At first it was found that the Pocom water which thus reached the wheel was not quite enough to turn it, and hence some of the water used in dressing in Salada had to be brought in by a separate lead in aid of the supply. This sufficed for the purpose, and the mine was effectively drained. But then came an accident to the Pocom ditch, and the water had to be turned off at the head during the repairs. The water-wheel stood still, and again the water rose in the mine. It was thus found that it would be necessary to have in readiness another supply of water for the wheel, and this was furnished by means of bringing in the water which works the Inferno stamps. The drainage operations being completed and free from fear of interruption the mining works at the lower levels could now go on in regular course. They anticipated very soon good returns from Salento and good profits, and when these were being realised a deep cross-cut from some land, the surface of which was lower than the surface at Salento, could be driven to the nearest shaft. This cross-cut would be about 180 ft. in length, and would come into the shaft at about 180 ft. By that time the three shafts would all be down to the 180 ft., and a level be driven at that depth, and thus the mine would be drained by gravitation down to 180 ft. The miners would be enabled to go deeper. All this it would be seen was independent of certain surface works now going on. Another cause for the delay in the realisation of the large profits anticipated was to be found in the Palmichala. This was a rich mine, and capable of being made prolific, but not by the existing means of pumping by steam-engine, hauling upwards, and stamping on the surface of the mine, where water was scarce. The mine was to be brought into a productive state by means of a cross-cut starting from the low land adjacent, and where water for stamping power was available. This cross-cut had been driving for upwards of two years. In the meantime the mine had been drained by the steam-engine, and a restricted output of mineral obtained. While the cost of driving the cross-cut had had to be met, the cost of pumping by steam had had to be met also, whereas when the cross-cut reached the shaft the cost of driving it would be less, and the pumping by steam, while the mineral drainage, and the means of outlet or mineral provided by the cross-cut, and the adjacent water for new stamps, would allow of increased returns. Another instance was the Tigrito, where a fifth level had been driven, and where it had been necessary not only to drive the level, but, as the outlet of such level was below the stamping mills, to supply apparatus to raise the ore to be got out of it. So Tigrito had lately been bearing the expenses of those works. Many other points could be mentioned—the V. R. Mine, where the fine lode was expected to be got at again, and also the prospects for late advances, the explorations made on the Manzanillo lode, where prospects were furnished profitable ones; and, therefore, the means of continuing to sink the shaft; the Rosario, where the workings had been connected with the Ruiz Works in Cordoba; the San Joaquin, where a great deal had been done to lessen the cost and the difficulties in working, owing to the ruinous state in which older workings had been left. He would not weary or confuse the meeting with too many details. He might say, however, that there was good ground for believing the turning point was now at last, and in truth about to be reached. The Chairman then referred to Mr. Robert B. White's prolonged presence in England, and expressed a hope that he would soon return to his post at the mines. He also alluded to a settlement which had been come to with the vendors, by which the unpaid portion of the purchase money—5000*l*—had been arranged, and a saving effected of at least 1500*l*, and resumed his seat amid applause.

The resolution having been duly seconded, a discussion took place, in the course of which several shareholders said they were not satisfied with the report. The Chairman said he had been put off with promises for so long, which had not been fulfilled, that they had lost confidence. The speakers did not complain so much of the board, who were guided by the statements of Mr. White; but thought that a change of management would be beneficial, one gentleman pointing out the instance of a Cornish company where a similar state of things existed; but when the mine was placed under new management dividends were the rapid result of the change.

Another SHAREHOLDER thought a blame should not be attached to Mr. White, the directors should bear a portion of it. It was also suggested that the directors should force a portion of their fees until the company paid good dividends. This suggestion did not meet with general support by any means.

A SHAREHOLDER, a medical man, said he had been dabbling in mines for 30 years. He had been in this mine from the commencement, and had invested some of his little savings in it and took shares. And what was the result? Nil.

They were told to look forward to the great results in three or four years; but he might be in his grave at that time. (Cheers and laughter.)

The CHAIRMAN, in reply, did not wish to conceal that the reports, in the first instance, were a great deal too sanguine—(applause)—but now they had a substantial yield of ore. He said at the last half-yearly meeting that Mr. White received no salary then, neither was he receiving any now. (Applause.) As far as fees were concerned, he did not see why the directors should give their services for nothing, as the demands upon their time were very numerous and important. He did not think the issue of circulars monthly should be discontinued, for it was only right the shareholders should have the opportunity of seeing how things were going on in the company. (Applause.) Mr. R. B. WHITE then addressed the meeting on various subjects, and in the course of his remarks he said he knew of many instances besides the Cornish one in which directors and managers had worked up the mines, bringing these companies almost to a paying point of good dividends, and that there had then been a change of management with the natural result of good dividends being paid. (Cheers and laughter.)

The report and statement of accounts were then put to the meeting, and were unanimously received and adopted.

The retiring directors, Mr. R. P. D. Monypenny and Mr. George D. Harris, were re-elected.

Mr. J. H. Tilly, the auditor, was re-appointed.

The proceedings terminated with the passing of a cordial vote of thanks to the Chairman.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The ordinary general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Thursday.

Mr. A. ROUTH (Chairman of the company) presiding.

Mr. CHARLES B. ROGERS (the secretary) read the notice convening the meeting. The report and accounts were taken as read.

The CHAIRMAN said: Gentlemen, there are one or two little matters which I will point out to you with regard to the business we have done during the year under discussion. The first thing is that the gross quantity of ore, regulus, and precipitate received from various mines from July 1, 1882, to June 30, 1883, has been 7683 tons 2 cwt. 2 qrs., against 10,715 tons in the previous year. The quantity of ore, regulus, and precipitate smelted at the Port Adelaide Smelting-works was 1593 tons 16 cwt., against 1702 tons 1 cwt. in the previous year. The quantity smelted at the Newcastle Smelting-works during the same period was 56 tons 13 cwt., against 793 tons 2 cwt. The quantity of copper made at the Port Adelaide Smelting-works from July 1, 1882, to June 30, 1883, was 344 tons 15 cwt. 18 lbs., against 353 tons 10 cwt. 3 qrs. 2 lbs., and the quantity of copper made at the Newcastle Smelting-works during the same period was 1175 tons 13 cwt. 1 qr. 24 lbs., against 1352 tons 3 cwt. 1 qr. 25 lbs. in the preceding 12 months. Upon that matter the only point to show you is that the supply of ore had decreased by 3031 tons, as compared with the supplies of the previous year. A deficiency in the supply of water had retarded the deliveries of ore from some of the Far North mines, but it was hoped that this difficulty had been overcome, and that the expectations of supplies from this source would be realised. New supplies of ore were also expected from New Zealand. The only other matter here is that the total increase in the supplies of copper during the year amount to more than 14,000 tons; yet, such has been the increased consumption, that the stocks of copper in warehouse, here and in France, on January 1, 1884 (excluding that contained in regulus and ore), show an increase only of 1500 tons. And then you will see that the profit and loss account for the year ending June 30, 1883, shows a balance of credit of 1455*l*. 1*l*. 1*d*. to which has to be added 1107*l*. 9*s*. 6*d*., the balance at credit of profit and loss on June 30, 1882, making together the sum of 2562*l*. 14*s*. 7*d*. The directors, having regard to the exceptional circumstances affecting the profit and loss account for the year under review, propose to appropriate from the reserve fund a sum sufficient, with the above balance, to make up a dividend of 1*s*. per share. Now, I think that I may here read to you, a short retrospect and prospect of the copper market, because upon that turns almost everything that we have to do. This retrospect and prospect is taken from the *Mining Journal*, and it will show you the course that copper has been taking during the year 1883. [The Chairman here read "The Retrospect and Prospect of the Copper Market," which appeared in our issue of Jan. 19.] When we had the pleasure of meeting together in the February of last year everything seemed to show that we were going to do a thoroughly good trade during the current year; but in the month of March last we were inundated by the whole year's supplies of copper from the United States which came in entirely upset the market, and it has only been by very gradual steps, before our agents here and on the other side that we have been able to steer so well during the past year. I am happy to say that my own private opinion is that we have got to the bottom of the depression. As we are smelters and not miners we shall naturally benefit, because we have purchased our ore at the low prices at which copper is ruling at the present time. We have, therefore, got very well through this troublesome time, and by dint of doing what we can, and by the whole year's supplies of copper from the United States which came in a large number of mines, and amongst them they have one mine which has been very largely developed, and in which at the present moment they believe they have got not less than 50,000*l*. worth of copper ready to come out when the price of the unit is such that it can be brought out and sold at a profit. Under our contract all that would come to us. Beyond the American supply of copper the fall has been effected in this way—of course, when copper goes down we have to make a reduction in the valuation of our stocks both on this side and on the other, and we have careful ourselves in a very strong position to meet the market, and nearly all our stock is realised, and we are in a position to go into the markets and get our ores at the best prices; but, no doubt, the depression will have a very bad effect upon copper mines, because many mines will have to go out of work owing to the extremely low prices ruling. When we had the pleasure of meeting last year we thought we should have had supplies from the Far North; but those supplies have not come to us for this more particular reason, that the whole year's supplies of copper from the United States have come in a large number of mines, and amongst them they have one mine which has been very largely developed, and in which at the present moment they believe they have got not less than 50,000*l*. worth of copper ready to come out when the price of the unit is such that it can be brought out and sold at a profit. Under our contract all that would come to us. 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SPONTANEOUS COMBUSTION IN COLLIERIES—No. II.

If the coal in a seam could only be preserved from getting crushed and fissured by increased pressure in working, or at any rate if all access of air could be cut off from it when so injured, its spontaneous combustion would be prevented. In the rare cases of quarrying an outcrop, the coal, as long as the overburden can be removed, can be worked in successive courses or steps from the top of the seam downwards, and can thus be got whole throughout the entire thickness of the seam. If the overburden be sent down the pit to serve as rubbish for packing the goaf in underground workings progressing simultaneously, the open-air working can be continued to a somewhat greater depth, at the risk, however, of finding that the deeper coal so reached has been already injured by settlement due to the underground operations.

When coal is got underground in successive courses or steps one below another from the top downwards, no packing in the goaf, not even were it masonry, will entirely prevent settlement of the superincumbent mass, whereby the coal in the lower and later-worked steps is always more or less crushed. A partial remedy consists either in packing with rubbish of a clayey nature, which consolidates into a more compact mass, or in leaving a sufficient thickness of coal underneath the packing of the goaf in the topmost course, and afterwards getting out as much as possible of this thickness by working backwards below it and packing the goaf of the lower working also; or again, in timbering the floor of each course so thoroughly as to form a roof for the subsequent working of the next course below. But these methods, besides being costly and yielding a low output with a large proportion of small coal, are not always successful in obviating spontaneous combustion, still less so when the goaf is not packed at all, but is left to fall in.

What has to be guarded against is an actual outbreak of fire; so long as the coal is merely heating the small quantity of noxious gas given off hardly matters, and the only drawback is that the workings sometimes get inconveniently hot for the men. The longer all risk of firing can be staved off the more possible will it be to adopt the mode of working that will yield the largest output at the lowest cost—in seams inclined at steep angles by laying out the workings in successive stages or panels of great height (measured up the slope), which entails less expense for the preparatory operations of laying them open; several of these stages are then worked simultaneously, the getting of the coal being proceeded with in each stage from the bottom upwards, by a succession of horizontal courses or excavations. By this method the bottom courses in each panel feel the roof pressure least, and yield a great quantity of large coal which is won without difficulty, and with less risk of heating and firing. But in the uppermost courses the coal gets more or less crushed by the augmented pressure; hence, to avoid fire, there must be some limit to the total height of each panel, or rather to the number of courses contained in it, the bottom courses being of greater height than the upper. In a thick and well stratified seam of strong coal, containing not many partings, and inclined between 14° and 30° to the horizon, the total height of each panel may be 26 yards, measured up the slope, and the height of the bottom course 8 yards. But in the main seam at Doyet, which though hard is of variable quality and too liable to fire, the height of the courses is only that of a single tier of timber props (say) 2 to 3 yards. Here four courses can be got, and a fifth started, without any fire having broken out; only no course must take more than six months in getting, and all the goaf must be thoroughly filled in. Quick getting is indispensable for avoiding fire in seams that fire readily. Usually by the time the fifth course is reached the broken coal it contains is already hot, and great care is needed to prevent its burning whilst getting; hence five courses would seem to be the general limit for the height of a panel. As soon as the third course from the bottom is being got in any panel the getting can be started of the bottom course in the next panel below; if the working of the lower panel were begun sooner that of the upper would be endangered by settlements.

Alike, in laying out the roads and in getting the coal, care must be taken to avoid the formation of roof cavities from which start cracks that radiate through the seam; such cavities are most liable to occur at junctions of roads, and are to be guarded against by careful timbering, which must be well watched. Large cavities occurring in spite of these precautions should be cleared out, and then thoroughly filled in with good packing of small rubbish brought from aboveground. Where gob-roads have to be kept open for working or ventilation they should either be shifted, so as not to run through the middle of the goaf but along its margin, or else they should be walled thick enough with good packing impervious to air and moisture, particularly when used as air-ways. They should be kept at a safe distance from any crushed pillars that have been abandoned in working. The advantages of packing the goaf with rubbish are that the workings are thereby kept cooler, settlements are less extensive, pillars get less crushed and are therefore less liable to heating, and fewer dangerous roof cavities occur in which an outbreak of fire would be difficult to extinguish. In packing composed of friable stuff the smaller bits fill up the spaces between the larger; and, if of a somewhat clayey consistency, the whole compacts under the load into a solid mass impervious to air. Good packing of this kind should always be used in the bottom courses of each panel, then by the time the top course is reached in the next panel below the coal will there be got under a roof as compact as solid sandstone.

Spoil got from stone drifts should not be used for packing the goaf; the large blocks of stone are too hard to crush under any settlement overhead, and air can pass too freely amongst them. In working a panel where the bottom course had been wholly packed with spoil got from sinking a shaft, and from driving stone drifts, notwithstanding that the spoil itself was incapable of heating, the author found that pillars of considerable size, which had been left behind in the midst of this spoil because not worth getting, grew hot so rapidly as to be taking fire by the time the second course was finished and the third begun. It was only by then surrounding this dangerous goaf with small rubbish carefully rammed in, that the winning of the coal could be finished to the top of the panel. Some years later, when the working of the next panel below came in under the same place, similar trouble from heating had to be encountered. Hence the author regards any spoil got underground as so bad for packing the goaf that it should never be used unless the precautions are taken to pick out of it all stuff that could burn, and even then to keep it clear of contact with any masses that can heat. It is indeed by no means a dead loss to send up all such spoil to bank, and throw it over the tips where after two or three years' exposure to the atmosphere it may, if meanwhile prevented from burning, become good enough to send down again into the pit for use as packing.

The best packing of all consists of loamy earth, and surface strata more or less disintegrated; the former is necessary wherever access of air has to be stopped at once without waiting for the roof to settle down heavily upon the packing. Where the goaf is well packed with good stuff, the timbers, whether upright props or roof slabs, can be left behind to become crushed by the load and buried in the packing; otherwise they should be removed, even if only partially, as a precaution against fire. By way of rendering the rubbish tips at the surface sooner ready for use as packing it is sometimes thought desirable to let them burn as freely as may be. But this opinion is not shared by the author who considers that not only will a tip take a very long time to burn through to the middle, but that, after the fire has all burnt itself out, the ash stuff will be too light, too dusty, too hot, and not binding enough, to be suitable for sending underground. Nevertheless, even such burnt rubbish is preferable to spoil got underground and packed there at once. Ventilation by a forced current of air under pressure has been found by the author to be favourable to spontaneous combustion. Whether compression or exhaustion be employed, the greater the difference of pressure between the entering and the return air currents, the more readily will the air penetrate cracked and crushed coal, and thereby promote heating and firing. In this respect sharp turnings or narrowing of roads and air doors situated in a strong current, in the midst of crushed pillars or badly packed rubbish, are sources of danger, as are also inclines rising steep and upcast pits. Hence, wherever an inlet

air-way runs at all near a return air-way the intervening pillars or ribs of seemingly solid coal require specially careful watching.

The coolness of the air current is practically of no value for preventing, though it may somewhat retard, the heating of cracked pillars, or of broken coal that has fallen from roof cavities or elsewhere. In a colliery where an old drift 4½ yards long, from a shaft to an inlet air-way, had been closed with rubbish carefully packed, the subsequent settlement of the packing had left a space above, into which a little crushed coal had fallen from the roof; the coolness of the ingoing air did not prevent this slack from heating and beginning to burn, and it had to be all cleared out, and earth rammed in its place.

A return air current should never have to go downhill, otherwise it accumulates heat and moisture at the upper end of the descent, thereby favouring spontaneous combustion at that place. Where distant workings are liable to be insufficiently ventilated, owing to negligence in maintaining former roads now used as air-ways only, fresh air should be supplied direct to them, either by splitting the main ingoing current, or by sinking a new shaft from the surface. It is better to split the air than to course a single current through too great a length, because the latter means greater difference of pressure attended with more risk of fire. At the Doyet collieries, wherever the seam is not thick enough to work by the foregoing method of horizontal courses, and where the expense of laying out the workings on that method would be too great, the plan is followed of getting the coal in inclined courses—that is, by pushing the working faces forwards uphill along the slope of the seam instead of horizontally along its strike. The uphill courses, however, are more difficult to keep open, and are liable to worse falls; each course takes longer to get, so that the surrounding crushed coal runs greater risk of heating, and this risk is further enhanced by the augmented draught consequent upon the air current passing up the slope from the lower to the upper end of the course; hence fire breaks out more readily, while it is also more difficult to contend with on the slope than in horizontal workings. On the other hand, the rather larger quantity of packing used in uphill than in horizontal courses is an advantage against fire.

Firing of slack heaps above ground can be effectually obviated, in the author's opinion, only by completely precluding all penetration of air into them. To ventilate them, with the idea of keeping them cool, he considers as ineffectual and as dangerous as to let air penetrate crushed coal in the pit. From experience of its success in smothering fires on the sloping banks of outcrop workings he recommends the expedient of covering the slack heaps with a layer of refuse slimes from the coal washers. Such a covering, being coaly and not clayey, does not set hard and crack, but follows readily any subsidence of the stuff beneath it. A layer 12 in. thick he believes would be an ample protection against firing, or even heating; and he suggests that on shipboard spontaneous combustion in coal cargoes might be altogether obviated by a layer 6 in. thick, the coal being so stowed as to prevent the covering of slimes from disappearing into the interstices. To prevent spoil tips from firing the stuff should be tipped in a layer too thin to heat under the action of the air, and should be left long enough exposed before tipping the next layer over it; if it be also freed beforehand from all coal that can be utilised, so much the better.

SELF-ACTING HYDRAULIC RAMS.—Although the efficiency and simplicity of the hydraulic ram has long been acknowledged by those who have tested it, so little has been done to make the merits of the arrangement known that its general adoption has been very seriously delayed. Wherever there is a fall of water a portion of that water (some is of course lost in obtaining the motive power) can be raised to almost any height at infinitesimal cost. Mr. JOHN BLAKE, of Accrington, has for some time past been erecting large numbers of these machines, and he has now published a handsome illustrated sheet, showing some of the purposes to which his improved self-acting hydraulic rams have been applied, and the inspection of the particulars cannot but create surprise as to their wide applicability. Two of the Blake rams were adopted for the Sheffield Union New Workhouse to force the water to a service tank in the rear of the house at an elevation of 110 ft., and the architect certifies that the quantity of water delivered is at the rate of 33,000 gallons per day, or 3000 gallons per day in excess of the quantity guaranteed. In another case it raises the water to a tank at an elevation of 480 ft., when a mansion, stables, conservatories, home farm, fountain, &c., are amply supplied. In both of these cases it is part of the water that works the ram which is used. But this arrangement is by no means indispensable. It often happens that a stream or brook is available for supplying the power although the water is not potable. In such circumstances the ram is placed over a well, the well water being admitted only to the part of the ram from which the supply is forced, the non-potable water from the stream passing through the other portion of the ram. Mr. Blake gives an illustration of one application in which the ram is worked by brook water whilst forcing up 20,000 gallons per day of pure well water to a water-tower at such an elevation that sufficient pressure for fire extinguishing is obtained. The overflow from the water-tower enters a small pond at its base, from which pond the overflow

is again gravitated to an ornamental lake in front of the mansion by a pipe of sufficient bore to give 25,000 gallons per hour periodically to three fountains in the lake, in addition to supplying the mansion, stables, farm, and gardens. Now it will readily be understood that if water can be raised with this facility for domestic and pleasure purposes it might with equal facility be elevated for industrial and mining purposes, and in the latter connection it will naturally suggest itself that it would frequently be more economical to elevate the water by so costless a process to the dressing-floors at the mine instead of carrying the ore to the water. Each application would of course have to be arranged according to the particular conditions prevailing, but the mere suggestion will suffice to put practical mining engineers on the alert.

ECLIPSE LUBRICATING OILS.—It was once shown in an interesting paper read before one of the mining engineering societies that the proper lubrication of the axles of the colliery trucks, and so on, very appreciably affected the economy of the establishment, and it was generally acknowledged in the discussion which followed that attention to lubrication was worthy of more importance than it usually receives. The Eclipse oils, manufactured by Messrs. JOHN BRADFORD and SONS, of Liverpool, are claimed to possess many important recommendations as compared with other lubricants in the market. They remark that a noticeable feature in their manufacture is the existence of grades. They believe it can be taken as a safe general rule that no simple oil taken from either of the three kingdoms, animal, vegetable, or mineral, is free from some objection or other. Whatever may be said to the contrary, their experience assures them that they must lay great stress on a judicious marriage or amalgamation of oils, under the guidance of science, as the true source of strength. In this way the weakness of one oil is counteracted by the strength of another. It is on this account that they claim that their oils are not only equal to sperm, Gallipoli, olive, neatfoot, rape, and lard; but for most machinery purposes vastly superior, because whereas these standard oils have each their own consistency only, and a given consistency is adapted only to given purposes, their oils are graduated in regard to consistency to do the work required of them, and to meet the special end in view. The oils have been extensively used for almost every purpose, and from the testimonials received appear to have given general satisfaction. All that seems necessary is to use ordinary care in the selection of the grade suited to the purpose for which the oil is to be employed, and if this be done no doubt need be entertained as to the result.

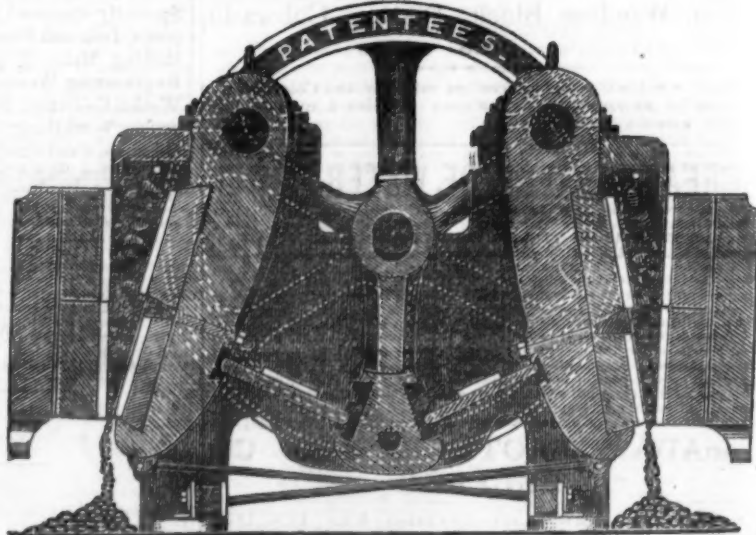
INTERNATIONAL HEALTH EXHIBITION.—Preparations for the holding of this Exhibition are proceeding rapidly. The Board of Trade have certified that the Exhibition is an International Exhibition, and exhibitors thereat will accordingly participate in the privileges accorded by the Patents, Designs, and Trade Marks Act of 1883. The General Committee now numbers nearly 400 members, and from these 17 sub-committees have been formed. These have all been doing valuable work in advising the Executive Council as to the nature of objects which it is desirable should be fully illustrated, in obtaining the co-operation of many persons of eminence in the various branches on which the Exhibition will treat, and in supervising the applications for space. The allotment of space, which has been largely applied for, is being rapidly proceeded with and applicants will soon be informed of the decision of the Executive Council with regard to their applications. In response to a request made by his Royal Highness the Prince of Wales, President of the Exhibition, the eight water companies of London have resolved to exhibit, in a pavilion which is being erected for them, their appliances for the supply, filtration, &c. of water, together with diagrams showing the various processes and localities; and a powerful sub-committee, under the active chairmanship of Colonel Sir Francis Bolton, has been formed to carry out this branch of the Exhibition. The water companies have also determined to put up in the grounds a large fountain, which will be illuminated at night by electricity. This Fountain of Light will, it is anticipated, materially add to the beauty of the illumination of the gardens. It is impossible, as yet, to give any definite information with regard to foreign countries; but, so far as one can judge at present, Belgium, China, and India will be the best represented. To China has been allotted the space which it occupied last year at the Fisheries Exhibition, and a Chinese tea garden, restaurant, and shop will not be the least interesting objects in the Exhibition. India is to be adjacent to China, and strenuous exertions are being made to secure the united action of many of the principal tea planters in India, so as to ensure a good and representative show of the Indian tea-growing industry.

EPPE'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Eppe has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette*.—Made simply with boiling water or milk. Sold only in packets, labelled "JAMES EPPE and Co., Homoeopathic Chemists, London."—Also makers of Eppe's Chocolate Essence.

NEW PATENT TWIN STONE BREAKER.

The very general adoption of the stone-breaker both for mining and general purposes has naturally caused inventors to give their best attention to the perfecting of the machine, and the result is that since the original Blake patent almost innumerable improvements have been introduced, and the utility of the machine has been increased. It has frequently been remarked that there must necessarily be a great loss of power in the back toggle, though the difficulty of preventing that loss was by no means obvious. Messrs. S. MASON and Co., of Leicester, have overcome the difficulty in a remarkably simple and ingenious manner—they make each toggle bar operate a movable jaw, so that the machine crushes at both ends, and the result appears to be in every respect satisfactory. It is claimed that the Champion Twin Stone Breaker—for so Messrs. Mason and Co. designate their improved machine—can with a given amount of power do twice the amount of work of any other, and when the principle involved is considered it is not surprising that the claims can be substantiated.

Amongst the advantages possessed by the Champion Twin Machine Messrs. Mason and Co. mention that it utilises the waste power which is well known to exist at the back of single machines. The stone at one end helps to break the stone at the other. You can work either ends (without working the other.) This is a great advantage, as, when there is a rush of orders, both ends can be set to work in a few minutes without any extra cost. The machine takes no more power to work both ends than it does to work one. The price of the machines is only the same that others ask for a single one. It will do twice the work of any others. It is the simplest machine in the world. It will break large sizes (say 2 in. cube) at one end, and small at the other if desired. This is done by changing the toggle plates, of which there are six sent with each machine (advancing ½ in. longer.) By putting one toggle plate in the top groove on one side of pitman, and the other in the bottom at the other side (see illustration above) there are four toggle grooves, by which is obtained a rocking and cracking movement, forming the stone into a cubical shape better than any other machine. It has

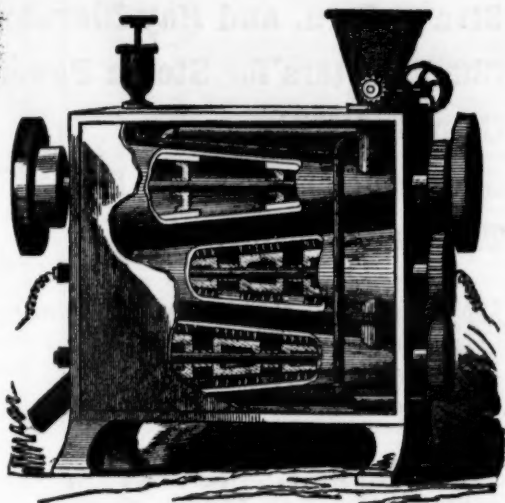


three kinds of movement, all others only having one, and that it can be made to crush to the size of peas or beans as may be required. Considering the advantages of the twin system it is unlikely that it would often be used as a single machine, but to provide against any inconvenience, should it be desired to use it in that way, Messrs. Mason and Co. have made ample provision. The two projections shown at each end of the twin machine are lugs for bolting up either of the jaws when not required. Although the machine will work singly without doing this, they advise it to be done, as it is no use working both ends when not wanted, as they can be set to work in a few minutes. When this is done the shaft at the bottom of pitman and one of the spring bars should be taken out. You then have a single machine equal to any in the market. The results obtained with the machine in everyday operation will be watched with interest and carefully recorded.

NOVEL ELECTRO METALLURGICAL MACHINE.

PROFESSOR JAMES MANES AND SONS call the attention of miners, mineowners, capitalists, and others interested in the working of gold or silver mines to their new Electro Metallurgical Machine for extracting fine and rusty gold from sands or tailings of stamp mills, or the sands of hydraulic gold diggings, or from the black sands on the coast of Oregon or California, and other parts of the world where gold is found.

The problem that has long troubled the worker of free-milling gold and silver ores is a method to save the mineral now lost in the tailings of stamp mills or flumes. This alone, if it could be saved, would amount to many million dollars profit each year, besides enabling the working of much territory which is now lying idle for want of an economical and thorough process of treatment.



Prof. James Manes and Sons, of Denver, Colorado, U.S., have invented a machine (represented in the above engraving) which it is claimed will save nearly the entire amount of mineral which passes through it, the loss not being over 10 per cent., and in many cases not in excess of half that amount. The machine is a cheap and practical process—it never need stop for charging or cleaning up, being nearly self-acting. Steam, electricity, and mercury are used in the process of extracting the mineral.

This machine or amalgamator is adapted for free-milling gold or silver ores, or refractory after roasting. It consists of a series of three or more large cylinders, wider at one end than the other, placed one above the other in a horizontal position, a shaft or spindle running through the centre of each. The ore and mercury are fed into the first cylinder, passing into the second, and then to the third. The first cylinder is furnished with steelmullers which nearly touch the sides of the cylinder, and revolve at a good rate of speed, mixing the mercury and ore. The second cylinder is furnished with large steel brushes attached to the shaft or spindle, revolving at a high rate of speed; through this a current of electricity is furnished by a Westinghouse dynamic electro machine, which materially assists in gathering the particles of very fine gold together, and thoroughly amalgamating the metal and mercury. The third cylinder is similarly furnished to the second; into this the amalgam passes, and is again acted upon and mixed by the brushes to catch any gold which might have escaped amalgamation in the second. A fourth cylinder may be used if found necessary.

The amalgamated pulp then passes through a revolving copper drum, plated with quicksilver inside. As the drum revolves it takes up the most part of the amalgamated gold. As the inside of the drum is constantly washed with a spray of water from perforated pipes fixed inside of said drum, a clean-plated surface is constantly brought in contact with the pulp or tailings as it passes out from the cylinders. After leaving the drum it falls down onto incline copper plates, the same as is now used in stamp mills.

The amalgam can be collected from the drum and plates without stopping the machine, and any live quicksilver that passes will be caught in syphons. The tailings are carried off with the water. The machine when attached to the flume will be driven by the waste water; it sifts the fine sands from the coarse gravel, and amalgamates it as above.

The specific points claimed by Prof. Manes and Sons in their patent are—
1.—The saving of almost all the mineral passing through the machine.
2.—The loss being less than 10 per cent.
3.—The entire absence of loss of the amalgamated material, thereby saving all the mercury, which, with the processes now in use, there is a large loss both of mercury and the precious metal.

4.—The small cost per ton at which the ore can be treated.
By the addition of the powerful current of electricity that passes off the revolving brushes, the most minute particles of gold will be caught and retained, which in the ordinary flume and stamps passes off with the water; this often amounts to a large percentage.

The inventors state that if English stock companies will give their assistance to work the black sands of Oregon and California by paying for the building of the machines, they will take a share of the gold for their services, or they will send their machines to any part of the world, or will sell patent rights to those desiring any of their patent machines or revolving furnaces for roasting or melting ores, ball pulverisers, &c.

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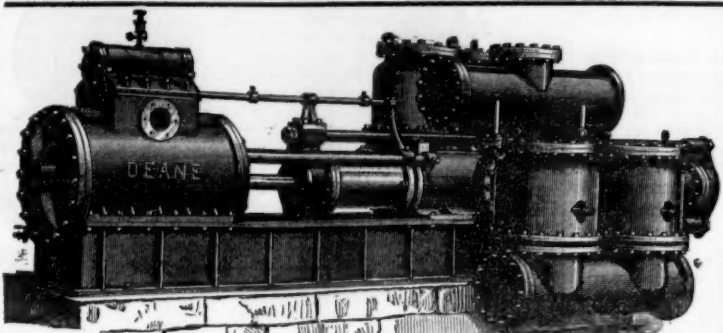
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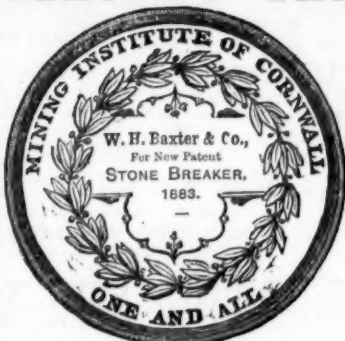
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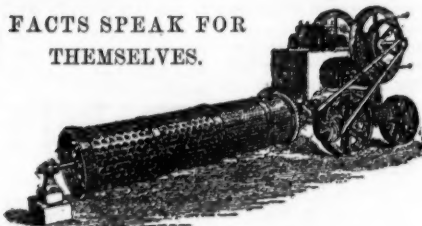
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18-1.



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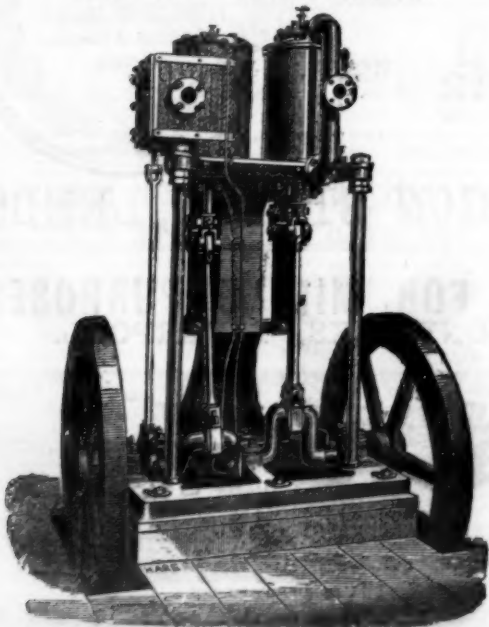
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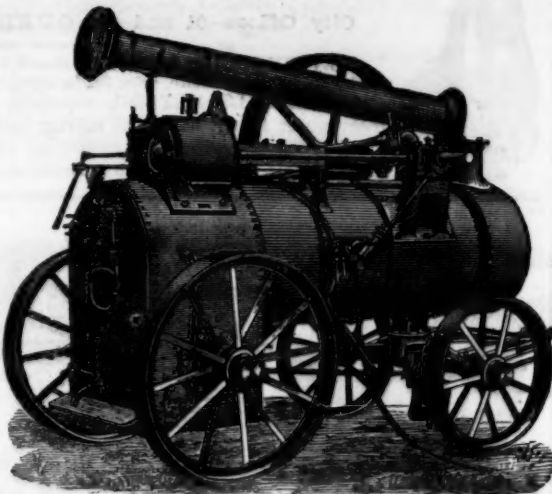
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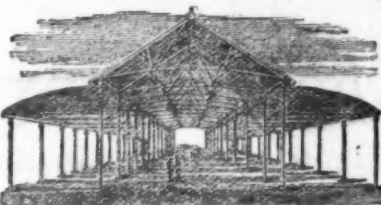
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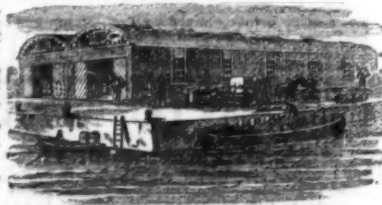
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